

# The Boston Medical and Surgical Journal

## TABLE OF CONTENTS

July 20, 1922

ADDRESS.		
THE PRESIDENT'S ADDRESS AT THE ANNUAL MEETING OF THE MASSACHUSETTS TUBERCULOSIS LEAGUE. By Edward O. Otis, M.D., Boston .....	93	Skin and Venereal Diseases. Edited by O. S. Ormsby, M.D., and J. H. Mitchell, M.D. .... 118
ORIGINAL ARTICLES.		
THE MANAGEMENT OF CANCER OF THE BLADDER. By George Gilbert Smith, M.D., Boston .....	97	Transactions of the American Gynecological Society .....
NUTRITIONAL DISORDERS IN THE LIGHT OF RECENT INVESTIGATIONS. By Alfred F. Hess, M.D., New York .....	101	Practical Psycho-Analysis. By H. Somerville, B.Sc., F.A.C.S. .... 118
SKIN IRRITANTS: EXTERNAL AND INTERNAL. By C. Guy Lane, M.D., Boston .....	108	A Psycho-Analytic Study of Psychoses with Endocrinosis. By Dudley Ward Fay, Ph.D. .... 118
TREATMENT OF FRACTURE INVOLVING LOWER END OF HUMERUS WITH ANTERIOR AND POSTERIOR WOODEN SPLINTS. By T. K. Richards, M.D., Boston .....	113	Bulletin of the Massachusetts Department of Mental Diseases .. 119
TWO CASES OF EARLY CARCINOMA OF THE UTERUS TREATED BY VAGINAL PANHYSTERECTOMY. By Louis E. Phaneuf, M.D., F.A.C.S., Boston .....	115	CURRENT LITERATURE DEPARTMENT. .... 119
BOOK REVIEWS.		
Collected Papers of the Mayo Clinic, Rochester, Minn. Edited by Mrs. M. M. Mellish .....	117	EDITORIALS.
Internal Secretion and the Ductless Glands. By Swale Vincent .....	118	THE EFFECT ON HEALTH OF ILLUMINATING OR FUEL GAS .....
		ARE THE MEDICAL JOURNALS OF THIS COUNTRY DOMINATED BY THE AMERICAN MEDICAL ASSOCIATION? .....
		BULLETIN OF THE ATHER CLINICAL LABORATORY OF THE PENNSYLVANIA HOSPITAL .....
		REPORTING DISEASES TO THE HEALTH DEPARTMENT .....
		OPINIONS EXPRESSED IN THE INDIANA JOURNAL .....
		POLLUTED DRINKING WATER .....
		MEDICAL WORK OF W.P.'S UNITED FRUIT COMPANY .....
		INFANT MORTALITY .....
		NEWS ITEMS .....

## Address.

### THE PRESIDENT'S ADDRESS AT THE ANNUAL MEETING OF THE MASSACHUSETTS TUBERCULOSIS LEAGUE.

APRIL 21, 1922, BOSTON.

BY EDWARD O. OTIS, M.D., BOSTON.

Not long ago the question was asked by one of our local associations what advantages they obtained from the League by being a member of it and contributing a portion of their Christmas Seal Sale income for its support. This is a fair question, for everyone wants to feel that he is getting his money's worth, and I shall endeavor to answer it. In all I have to say I shall assume that the League is wisely and efficiently conducted, and its income economically expended, and that it always endeavors to act for the best interests of its component parts—the local associations. Further, I may make the preliminary remark that in all organizations there must be a reciprocal relation between the parts and the whole—a giving as well as a taking. In the first place it is obvious, I think, that any undertaking with a similar object in view, whatever its character, gains strength, solidity and prestige by the union and co-ordination of its component parts, each local organization at the same time retaining its own autonomy and carrying on its own special work. By becoming, however, a member of the larger unit, in this

case the State League, there are many ways in which the local association may gain aid in its work, and in turn aid the State Organization by its influence and experience.

As you know the State Associations are members of the National Association and, in consequence, each local association becomes *de facto* a member of the great National body, one of the most efficient of its kind. It has been said, in the world. This National Association is constantly developing new methods and programs for the most effective procedures in the tuberculosis warfare, all of which, through the State League, are at the service of the local associations. The National Association offers methods of publicity, administration, field, educational and medical expert service and conducts research work. Through the State League the local bodies share the fruits of the National body as well as contribute their parts to its success. We could not, indeed, carry on the Christmas Seal Sale without the aid and direction of the National Association, for it has become such a vast undertaking that only the larger body could successfully inaugurate and finance it.

Again, a State organization can obviously take a wider view of the whole State problem of tuberculosis and better appreciate what is needed. It is in a position to suggest and advise general policies and methods for local bodies so that they may most effectively solve their own local problems and most wisely and economically spend their money. This the

League is constantly called upon to do. It is the League which represents its component organizations in legislative matters, both in safe-guarding its own special field of health work and in advocating good and opposing vicious health legislation. For example, through its representatives it advocated the light-saving law and more accommodations for non-pulmonary tuberculosis, a bill which is, I believe, now before the Legislature.

In all philanthropic movements we are dependent upon public sentiment and public good will, and this can best be obtained and crystallized by bodies which are both State and nation-wide in which the public have confidence. It is the one large State association that the public look to for information and guidance in the tuberculosis campaign. In any undertaking nowadays publicity is of utmost importance, and it is the State League which must and does do this for the State, as the National Association does it for the Nation. Although each local association has its own peculiar problems, there are certain general lines of work common to all, such as a tuberculosis survey, expert diagnostic service, tuberculosis nursing, etc., and such common service the League endeavors to provide and render effective. "None of us liveth to himself" for we all realize sooner or later that the satisfactory and satisfying life is one of service. Although the larger and better organized local associations have less need for direct service from the League than the smaller ones, and may feel that they are sufficient unto themselves, and are rather reluctant to contribute their percentage from the Seal Sale to the League, yet is it not worth while to feel that a part of their contribution is being used in the aid and support of some weak and struggling association in a community which could not obtain sufficient resources itself for work needed to be done in its midst?

Again, the office of the State League is a general clearing house for all sorts of information, appeals and complaints. Thither comes nurse, tuberculosis worker, doctor or layman, interested in some phase of tuberculosis work; all wanting information, advice or guidance in their especial problems. Furthermore, the Executive Secretaries are constantly going about the State visiting the local associations, learning from some, stimulating and advising others, and setting on their feet those who have fallen down and ceased to function. Perhaps, it is not generally known that several times a year the Executive Secretaries, of all the New England Associations, meet together to discuss general tuberculosis problems and to exchange their experiences, and such meetings are very fruitful in gaining new viewpoints and in solving many problems in State tuberculosis work.

Each secretary gains new ideas and valuable suggestions and these rebound to the benefit of the local associations.

Through its committees the League is constantly studying various phases of tuberculosis and health work, such as the standardization of surveys, the education of tuberculosis nurses, the care and provision for those suffering from non-pulmonary tuberculosis, and health legislation.

Last year the League made a small appropriation for research work in the study of tuberculosis among children under the direction of Dr. Maynard Ladd in the large Children's Clinic of the Boston Dispensary, the object being to determine the amount of tuberculous infection in children, from infancy to adult age, and the best means of preventing this infection from becoming active disease. In this connection there was a study made of excised tonsils to determine what proportions were infected with the tubercle bacillus. Already valuable data have been obtained and it is hoped that this research work may be continued if our funds will permit. As I said in the beginning I have assumed that the executive management of the League is active, efficient, intelligent, progressive, and economical with the funds entrusted to it, and of this you, the local associations, are to be the judges, for the League is your servant.

Finally, and in a brief sentence, the State League exists for the purpose of studying and promoting the best and latest methods for carrying on the anti-tuberculosis work in the State and in so doing promoting the public health.

If the League is an important instrumentality in combating tuberculosis, as I have endeavored to show, and is to be a continuing body, then it must receive adequate support and not be dependent entirely upon the more or less uncertain income from the seal sale. Why should we not seek an endowment? More than one of our local associations have received legacies, and why should not the League which is soon to be incorporated, appeal to the public for means to place it upon a solid basis? What more appealing object than the prevention of tuberculosis? Tuberculosis is, and is likely to remain for an indefinite number of years to come, a very prevalent disease. All fear it and all, directly or indirectly, have suffered from it, and all should lend a hand in its suppression.

The State, as well as the counties, are spending large sums for the care of tuberculous adults in their various sanatoria, but the tuberculous children are being neglected, and tuberculous children respond so quickly and satisfactorily to treatment. We need one or more sanatoria exclusively for children. Connecticut, for example, has two such institutions, one

on the seashore and one inland, where heliotherapy is being employed with striking success. France has for years maintained large seaside sanatoria for children and so have other European countries. I have only to refer to the admirable results obtained by Dr. Chadwick, at Westfield, to indicate the extreme value of sanatoria for children. The League, it seems to me, might well undertake a propaganda to influence public opinion in favor of greater accommodations for tuberculous children. For children suffering from bone and joint tuberculosis sea-side sanatoria have been found particularly favorable, and it is to be hoped that in making provision for non-pulmonary tuberculosis, as is now contemplated by the State, provision will be made for a sea-side institution for children suffering from non-pulmonary diseases.

An interesting incident was told me the other day of a little girl who was sent to the Connecticut sea-side sanatorium strapped to a board, suffering from spinal tuberculosis. She recovered from this, but meanwhile developed pulmonary tuberculosis. She was then transferred to the inland sanatorium where she recovered from her pulmonary affection and is now a robust, healthy girl. Such is the resiliency of childhood!

The public are beginning to realize that prevention is better than cure, and as I shall show later, this is especially true with regard to children, hence so-called preventoria are coming into existence. There is one connected with the Sharon sanatorium, and the Boston Tuberculosis Association is about to open one at the Prendergast Camp. In Toronto there is a flourishing institution of this kind, of which some of us have heard through Dr. Elliot, and a number of others elsewhere. Such preventoria are equally valuable for young adults. At St. Agathe, in the Laurentian Highlands of Canada, is such an institution for young women of depressed physical condition. Who can estimate the value of such institutions and the number of active cases of tuberculosis prevented by this timely aid? The economic saving to the community of such preventoria is obvious. It is so much cheaper to prevent the child and young woman from developing tuberculosis than to try to cure them after the disease has become manifest. Here is another object for a League propaganda — the establishment of preventoria in the State, and I am sure they will come in the near future.

Medical Social Service, introduced some years ago through the genius of Dr. Richard Cabot, has abundantly demonstrated its usefulness, and has become an established institution in the best hospitals and dispensaries. Anyone who has worked in a clinic with an accomplished, wise, and sympathetic social worker, knows how inval-

uable her services are in dealing with tuberculosis. She is, indeed, a ministering angel. Some State sanatoria include in their personnel such a social worker, and we should in ours, which, I believe, at the present time is not the case. The psychic treatment of a tuberculous individual is often quite as important as the medical, but the medical attendant has not the time and, perhaps, not the talent or experience to minister to a mind distressed or worried. Unless the mind is at rest, and free from anxiety, the physical condition will not only not respond to treatment, but will retrograde, as Dr. Waters, of the Loomis Sanatorium, has very cleverly shown by the comparison of x-ray plates of a tuberculous patient, taken at varying intervals, which showed evidence of advance of the disease when the patient had been worrying over some unfavorable news from home. A word of sympathy, a bit of comfort, a sympathetic attention to the story of an overburdened heart, from the social worker may accomplish more for a lonely, discouraged, worried sanatorium patient than any medical treatment can do. In this materialistic age we, and I include the doctor, are too apt to "mind the things of the flesh" and ignore "the things of the spirit." It is often easier to treat a bodily pain than to soothe a troubled mind, but to remedy the latter may result both in health and happiness. "It should be the special business of the social worker," says Dr. Cabot, in referring to tuberculosis, "to point out that not for economic, but for spiritual reasons, it is a dangerous experiment to take a man away from his work and put him on his back in a steamer chair for months at a time."

As you are aware, much has been said and written regarding the discouraging results of sanatorium treatment. At first we thought the tuberculosis problem was well on the way to its solution, when the sanatoria came into existence and patients were discharged "cured," as we then labeled them. Time and experience, however, have taught us that sanatoria effect but little the incidence or prevalence of tuberculosis, and the best we can say now, regarding a patient who seems to have recovered, is that his disease is "arrested." Even of these "arrested" cases a certain proportion relapse and still more of the "improved" cases; and with every relapse the money expended in the treatment is wasted. From all this it is apparent that more after-care and supervision is needed. For each patient discharged from the sanatorium there should be someone whose definite duty it is to keep him under supervision. If not otherwise provided by the State, why could not the local associations undertake the responsibility of following up those patients who belong to their community? The problem of obtaining work for the arrested case of tu-

berculosis is a very difficult one and, as you know, many plans have been suggested but none so far have proved practical upon a self-supporting basis. At present not a few industrial establishments seem willing to take for part time, or for light jobs, these arrested cases. The Boston Tuberculosis Association undertakes to find such employment for these persons, and other associations might well follow their example. We must recognize the fact that when the tuberculous individual is discharged from the sanatorium the work is but half done. He must be followed up, by visiting nurse, social worker, or some competent person, and if able to work effort must be made to obtain such suitable employment for him as will not jeopardize or undo the gain or arrest he has obtained from his sanatorium treatment. Otherwise, the money spent for such treatment is likely to be an economic loss.

Some years ago President Eliot, in an address on "The Coming Changes in the Medical Profession," said that the probability was that the greater part of the work of medical men was, hereafter, to be done in preventive medicine. We may consider this a prophecy of perfection rather than a realizable attainment, for we shall always need the individual services of the physician for our individual need, in the chances and changes of this mortal life. There has been, however, an increasing and pronounced appreciation, on the part of the public, and of the medical profession as well, of the supreme value of preventive medicine or, to use a better term, of the prevention of disease. As Dr. Robertson, the late Commissioner of Health of Chicago, says, preventive medicine is the intelligent demand of a now intelligent public. The presumably well are now seeking, or being asked to have a medical examination, to see if they are really as well as they think they are, and are in physical condition for their self-imposed or directed duties, and if their habits of life are consistent with continued well-being. We have, for example, the "Life Extension Institute," and the so-called "Health Clinics," a notable example of which is now conducted at the Boston Dispensary. Expectant mothers are kept under observation to prevent certain disasters incident to that condition. We require vaccination to prevent smallpox, and advocate the Schick test for children, and the toxin-antitoxin injection, if this test is positive, to prevent diphtheria. We employ the anti-typhoid vaccine to prevent typhoid fever. And experimental work is now being done to discover a vaccine to prevent pneumonia. The American Society for the Control of Cancer urges frequent physical examinations in order to detect malignancy in its earliest stages and thus prevent its development into a hopeless condition. It is becoming increasingly the custom in large

industrial concerns to examine the employees when they enter the industry and periodically thereafter. We have the medical examination of school children and of academy and college students. In Massachusetts, and I know not how many other States, an examination is required, of children of 14 to 16 years of age, before they can enter an industry, in order to prevent the development of any weakness into disease. You will recall that President Roosevelt instituted periodic examination of the officer personnel of the army who were presumably well, and the present Surgeon-General of the army declares that he firmly believes in periodic examination of the civic population.

According to Dr. Haven Emerson (*Journal of the American Medical Association*, March 25, 1922, page 901), an increasing number of people attend the cardiac clinics in New York City to find out whether or not they have cardiac disease, and not how they may be cured when they have heart disease, and Dr. Emerson says that there has been set up by the Academy of Medicine, of New York, a series of examining stations where physicians examine people, who are presumably well; health clinics we should call them. There are now classes for the examination of the mental capacity of persons of various ages to prevent mental disease or regulate the mental habits of the individual. The same authority (Dr. Emerson) states that in the thirty-one tuberculosis clinics of New York City, in the last 15 years, one million people have been examined, and in the year 1921 66 per cent. of the people who went to clinics were found to be non-tuberculous, the percentage having risen from 20 per cent. to 66 per cent., a million of the population. Hence, it is evident that an increasing number are being examined to find out the condition of their lungs, not that they suspect or have symptoms of tuberculosis. When we consider all these already existing instrumentalities for preventive medicine we must confess that President Eliot's prophecy is well on the way to fulfillment.

The experience in the great war is familiar to us all, where a surprisingly large number of physical defects were discovered, hitherto unsuspected, in supposedly well young men. This experience has impressed the public. I believe, as to the prophylactic value of health examinations and health clinics, and with but little urging, I believe, the people would eagerly seek such physical examinations. One of the most important parts of such a health investigation is a thorough examination of the lungs of presumably well persons. To be sure, we as tuberculosis workers have always made prevention an important part of the campaign against the disease, but in the past we have largely confined our efforts to the prevention

of the spread of the tubercle bacillus. Should we not now make a more pronounced effort to persuade the *well* to have an examination of their lungs, and should we not join with other health organizations in the rapidly increasing movement in the prevention of disease? You will recall that in the Framingham Health Demonstration all the inhabitants were offered and urged, to have an examination of their lungs, and important results were obtained thereby in the discovery of unsuspected pulmonary disease. Why could not the clinics, now held by the experts of the State Board of Health, enlarge their functions, and offer to everybody who wishes it an examination of the lungs and urge the importance of so doing? So long as pulmonary tuberculosis still continues to be one of the most prevalent and dreaded diseases of modern times the advantage of such examinations, both to the individual and the public, is obvious. The most successful means of preventing tuberculosis is to prevent its happening. Still better it would be if the tuberculosis expert should join with experts in other departments of medicine and hold health clinics which would include a complete physical examination. When once the public recognizes the supreme value of such health clinics, there will be no dearth of applicants.

"One thing necessary," says Dr. Wightman, of the Chicago Municipal Sanatorium, "for those who would be well is an annual physical examination. It is only by means of such examinations that the doctor is able to prevent the development of disease. The intelligent have already learned that if they go often enough to a good dentist he will prevent any serious dental troubles from developing. The same class of people will soon know that if they go often enough to a good doctor (or to a health clinic) any serious physical trouble will be prevented from developing." We must persuade the thoughtless majority, who consult the physician only when they have an ache, or a pain, or feel ill, to recognize also the value of periodic physical examinations to prevent the pain or illness, and to have their lungs examined to prevent tuberculosis.

### Original Articles.

#### THE MANAGEMENT OF CANCER OF THE BLADDER.\*

BY GEORGE GILBERT SMITH, M.D., F.A.C.S., BOSTON.

THE management of cancer of the bladder is rather a complex problem, inasmuch as the methods of treatment vary widely according to the type of growth. In discussing this ques-

tion, it seems to be necessary to start with a brief review of the pathology of vesical neoplasia, and to attempt to separate the lesions into classes more or less according to the kind of treatment which each class requires.

For the point of view of the pathologist, let us turn to the 1922 edition of Ewing's book on "Neoplastic Diseases" (p. 860 *et seq.*). There we find the epithelial tumors of the bladder classified as follows: Papilloma—fibrous; benign; malignant. Carcinoma—adenoid (rare); diffuse. We are justified in including the papillomata among cancers of the bladder, for all papillomata are potentially malignant. They consist of a connective tissue framework, more or less branched, covered with a layer of cuboidal epithelial cells. It would be impossible to say whether any particular papilloma was malignant unless one could examine every bit of it microscopically, for some parts may appear entirely benign, while in other areas the cells show a method of growth, a heaping up and a breaking through the basal membrane, which is characteristic of carcinoma. Ewing says that 25 per cent. become malignant; Frisch reports three cases in which the removal of a simple papilloma was followed by the development of single or multiple carcinomata. Ewing states, furthermore, that "the microscopic structure usually indicates considerable growth capacity which in other situations would always prove malignant. The clinical malignancy is also influenced by the tendency of new tumors to develop progressively in a predisposed mucosa" (pp. 861-2). This evidence should be enough to warrant the inclusion of simple papilloma in a paper on cancer of the bladder; a papilloma which shows necrosis is practically certain to be malignant.

The career of a papilloma is interesting. It may exist for years without undergoing much change, causing either no symptoms or a painless hematuria, and suddenly it may start to grow rapidly and acquire malignant characteristics. I have never seen a benign papilloma reach a size larger than perhaps two cm. from stem to tip. The larger ones have either been proved to be carcinoma by the microscope or have shown, by their recurrence as a definite cancer, that they were indeed malignant. Ewing says that 75 per cent. of all papillomata reach an urgent condition or are fatal in three years.

Malignant papillomata, or papillary carcinomata, may grow so large as to fill the bladder. Clinically they appear as round, partially necrotic tumors which bleed very easily. Although they appear solid, their tissues are as friable as a piece of blood clot. Their cells are easily transplanted to other parts of the bladder, or to the operative incision. They are attached to the bladder wall by a thick pedicle,

\*Read at a meeting of the Essex North District Medical Society, May 3, 1922.

or sometimes by a broad infiltrating base. Often multiple, the smaller ones appear through the cystoscope as low, bushy growths which are attached firmly to the bladder wall, and do not wave in the current as do benign papillomata.

Malignant papillomata often become encrusted with phosphatic deposits and infected, thereby setting up a severe cystitis.

Buerger believes that of all cancers of the bladder, from 30 to 36 per cent. originate as papillomata.

Those growths which have not this origin develop directly in the bladder mucosa. They may assume a glandular form, if derived from the mucous glands of the bladder, but this type is rare. The common form is a sessile growth, very firm to the touch, sometimes covered by intact mucosa, but more often slightly ulcerated. Occasionally the ulceration is more marked with elevated, indurated margin. Some writers divide these into transitional or squamous cell cancers, but this distinction is of little practical importance.

These growths are less likely to be accompanied by infection. As they progress, they may show proliferative changes; in this stage infection is frequent. The growth extends through the bladder wall into the perivesical tissues and to the regional lymph glands. Both Ewing and Judd remark upon the slowness with which cancer of the bladder metastasizes to distant points. I have seen two cases recently in which distant metastasis occurred—once in the third lumbar vertebra, and once in a supraclavicular gland. From my own experience I would say that metastases in the spine were not at all uncommon.

By far the most important factor in the successful treatment of cancer of the bladder is early diagnosis. Unfortunately one sees a number of cases in which the diagnosis should have been made months, or even years, before. Such occurrences are a disgrace to our profession; every case of hematuria in which the bleeding is not due to an obvious cause should be cystoscoped. The omission of this simple and easily available test in a case of symptomless hematuria is as indefensible as the failure to give antitoxin in a case of diphtheria. Every case of hematuria and every case of irritable cystitis unaccounted for by obstructing prostate or by urinary tuberculosis should be suspected of cancer, especially if the patient is above 30 years of age. If the urine has a peculiarly foul odor, suggesting decayed tissues, the diagnosis can be made, almost for certain, without further examination.

Observation cystoscopy, which is today, thanks to the small calibre of the modern cystoscope, a very simple procedure, will give the diagnosis and will tell us with which type of growth we have to deal. If the bleeding is

excessive, it may be necessary to place the bladder at rest for a week or so by an indwelling catheter; if this is done, with the aid of adrenalin solution instilled into the bladder, a fair view can almost always be gained. A careful general examination should be made. Bimanual palpation of the bladder with a finger of one hand in rectum or vagina and the other hand making pressure above the pubes, will give valuable information as to the presence of induration within or about the bladder. Search should be made for glandular masses within the pelvis or upper abdomen. An x-ray of the spine is useful in certain cases. The age and general condition of the patient must be taken into consideration, and an estimate made of his probable vitality and ability to resist infection.

When, by careful study, the surgeon has discovered with what type of lesion he has to deal, he must decide upon his method of attack. There are the surgical measures of cystostomy with cauterization; permanent cystostomy, partial resection of the bladder, and total cystectomy. There are the measures possible to employ without opening the bladder, such as fulguration and the application of radium. There are various combinations of these.

Let us now turn to the treatment of the several types of growth encountered in the bladder. Simple papilloma is delightful to treat. Practically all of these, if they are really not malignant, respond readily to fulguration, or destruction by means of the high frequency spark. Through the cystoscope the electrode is pressed against the tumor and the current turned on. Bubbles of gas rise from the point of contact; the tumor for a millimeter or two about the electrode tip blanches and shrivels up. If the tumor is small, the stalk may be cut across directly; if larger, it is destroyed at several sittings. Malignant papillomata do not respond so well; if, therefore, the tumor is easily destroyed, the chances are that the mucosa at its base is not involved. The largest papilloma which I have destroyed by fulguration was the size of a small plum.

There is, as Ewing states, a predisposition on the part of the mucosa of such bladders to form papillomata. Sometimes the recurrences will be definitely malignant. It is essential, therefore, to cystoscope these cases frequently so that recurrences may be detected while small and be given appropriate treatment. I have the patients return every three months for the first year, then every six months for two more years; after that, once a year.

Let me give a few illustrative case histories: F. E. H., a traveling salesman of 46, came to me in April, 1915, with the story that six months previously he had noticed a little blood at the end of urination. This ceased almost entirely, but the week before his visit to me

the urine was bloody throughout. The force of his stream had been lessened. Cystoscopy showed a good-sized, filamentous papilloma arising from the right ureteric ridge, hiding the orifice of the ureter. This was completely destroyed by nine fulguration treatments. February 23, 1916, cystoscopy showed no recurrences. August 22, 1916, one tiny bud back of the right ureter was discovered and destroyed by fulguration. December 28, 1917, cystoscopy showed no recurrences. Since then the patient has not returned for cystoscopy, in spite of a letter asking him to do so.

G. A. D., a plumber of 34, consulted me August 20, 1919, because of hematuria which he had had constantly for one year. Cystoscopy showed a papilloma the size of a bean rising from the left ureteric region. The tumor and the mucosa from which it arose were destroyed by three fulgurations. Cystoscopy in June, 1920, showed no recurrence. January 20, 1921, a tiny bud was seen upon the left side of the trigone and was destroyed. There was not even a scar left to mark the spot where the original tumor had been.

Inasmuch as the recurrent papillomata which I have seen have usually risen from a different area than that upon which the original growth was situated, it seems reasonable to assume that they would have developed, no matter whether the tumor was excised or was destroyed by fulguration. The destruction of simple papillomata by the latter method, therefore, seems to me to be without question a better procedure than radical operation. If the tumor is bushy or necrotic, the question of treatment is a different matter. The tumor then is probably malignant; consequently there is a likelihood of involvement of the bladder mucosa at its base, and the removal or destruction of the bladder wall at this point is indicated. If the tumor is so situated that it can be excised together with the entire thickness of the underlying bladder wall, this operation should be done. If the tumor arises from the trigone or the vesical sphincter, thereby making its thorough removal very difficult, or if the patient is not in condition to stand a long operation, the bladder can be opened, the tumor destroyed by the cautery, and radium implanted in the bladder wall in such a way as to slough out the tumor-bearing area. In case any operation is contraindicated by the patient's condition, or if the tumor is a recurrence following a previous operation, so that one does not feel it advisable to operate again, one may implant bare tubes of radium emanation in the bladder wall beneath the growth by means of the operative cystoscope and a flexible, needle-pointed "drill." One or two of these tiny glass tubes, or "seeds," are deposited in the tissues and left there. Each seed should be of low potency, from one to three mc.; the beta and gamma rays given off

will destroy the tissues over an area 1.0 cm. in diameter, and at the end of a week the seed will have lost its radioactivity.

We come now to the question of treatment of the more extensive cancers of the bladder, both of the degenerated papilloma and of the sessile cancer type. It may be said at this point that when cancer of the bladder has reached a certain point, there is no method of treatment yet discovered which will avail. At the Huntington Hospital we occasionally have such advanced cases sent in for radium treatment; when the bladder feels like a cannon ball and the pelvis contains great masses of cancerous lymph glands, there is no help for the patient.

Certain cases, however, may appear to be quite advanced when the interior of the bladder is viewed through the cystoscope, and yet may be amenable to the right sort of treatment.

We may divide the more extensive cancers of the bladder into two classes, the localized and the diffuse. The former are more deeply infiltrating, more scirrhus, and slower of growth. They are less likely to be accompanied by severe cystitis. All these points are factors in influencing our selection of a course of treatment. If the localized cancer is situated high up on the lateral wall or upon the dome of the bladder, and does not appear to have penetrated the bladder wall, a wide excision is the best procedure.

C. K., a woman of 55, came to the Massachusetts General Hospital with a history of having been passing clots of blood in the urine for the preceding two weeks. Cystoscopy showed a growth on the right lateral bladder wall, including the ureteral orifice. In July, 1920, I excised a solid tumor the size of a small plum; the entire thickness of the bladder wall was removed, including the orifice of the ureter. The resected ureter was reimplanted in the bladder. As the growth appeared to involve the entire thickness of the bladder wall, the perivesical tissues upon the right were given radium treatment; 25 mg. of radium element, screened by one mm. brass and one mm. rubber, was placed at the bottom of the perivesical sinus one week after operation and left in 24 hours. The patient made a fairly good recovery and in October, 1920, felt quite well. Cystoscopy showed a mild cystitis, but no evidence of recurrence. The orifice of the implanted ureter could be seen as an oval slit which opened and closed much like a normal orifice. January 28, 1921, cystoscopy; the same findings. In March the patient began to have sharp pains in right knee, thigh and lower back. Pelvic examination showed no induration and no glandular masses. The back pains became worse; they were evidently due to metastasis. The patient rapidly failed, and died, about one year after operation, with metastasis in the lung.

A good many of these localized cancers are situated close to the prostate or down in the funnel of the bladder neck, so that excision, and particularly closure of the bladder wall to fill the defect, is almost impossible. In such cases the implantation of radium gives the best results.

As this method of treatment is fairly new, and is, moreover, one in which I have been extremely interested, I shall digress from the main theme for a few moments to go into the question of radium treatment in some detail.

From our experience at the Huntington Hospital we have come to the opinion which I think is now held by most genito-urinary surgeons, that it is next to useless to treat infiltrating cancer of the bladder by radium introduced into the bladder and applied, more or less accurately, to the growth. The cancer, to be destroyed, must be sloughed out, and the best way to accomplish this is by means of radium implanted directly into the tumor. The means of radiation may consist of needles containing radium salt, in which case a number of small needles, of 5 mg. each, are preferable to fewer large ones; or it may consist of little glass tubes containing radium emanation. If the needles are used, they should be inserted about one cm. apart and pulled out by means of thread after 24 or 36 or even 48 hours, according to the amount of radiation desired. If the emanation tubes, or "seeds," are used, they are abandoned in the tissues. In either case the effect is substantially the same. Close to the needle or tube the tissues become completely necrotic; further away there is a zone in which the cancer cells are killed but not sloughed out. Beyond that is a zone in which infiltration with leucocytes and fibroblasts takes place, forming a barrier of dense connective tissue. The center of the growth, where the rays from the tubes cross each other in all directions, sloughs away. Around the periphery there is found a barrier of connective tissue which prevents the spread of cancer cells by way of lymphatics. The process of destruction and repair takes from two to six months, depending upon the condition of the patient and the extent of the reaction. Infection may supervene, and sometimes causes the death of the patient.

The application of this method to bladder cancer is limited to those cases in which the area to be radiated does not exceed 3 or 4 cm. in diameter; if larger growths are radiated, the extensive necrosis is likely to prove more than the patient can stand.

Of the earlier cases which we treated by this method, several died in from six weeks to three months after operation, and in one case eight months later, apparently from the toxic absorption or from renal infection consequent upon the bladder condition. In half a dozen cases, about half of the number treated in this way,

excellent results were obtained. One case will illustrate this class.

A. Y., 65, carpenter, seen August 5, 1920. Complaint: Hematuria for eight months. Cystoscopy showed an extensive ulcerative growth, with elevated edges and necrotic center, on left lateral wall of bladder, not much influenced by application of 450 mc. of radium intravesically. Operation on February 10, 1921. Cystotomy; slightly ulcerated growth, about 3 cm. in diameter, found in left lateral wall of bladder. Incision seems to extend through bladder wall and is palpable by rectum. Piece excised for examination proves the diagnosis; whole tumor lightly cauterized. Twelve seeds of from 1 to 4 mc., total 32 mc., implanted in growth. Convalescence uneventful, except for epididymitis. No marked radium reaction. April 28, 1921, urine very dirty. Frequency every one or two hours. Slough which formerly covered left side of bladder has almost entirely cleaned up. June 30, 1921, patient gaining weight. Feels well. Cystoscopy; area of tumor almost entirely healed and covered with mucosa. August 18, 1921, back at work. Nocturia once. Cystoscopy; left wall of bladder practically healed. January 19, 1922, looks well and says he is in the best of health. Last night did not have to void at all and holds urine for three hours in day time. Urine slightly hazy. Cystoscopy; bladder clean and smooth. Prostatic outline shows definite adenomatous changes but is much less red than three months ago. In base of bladder, outside of left ureter, is a shallow fossa, the bottom of which is still covered with necrotic tissue. No evidence of malignant disease. To return in three months.

As was said above, the use of this method is limited to localized carcinoma. The diffuse, superficial type must be handled differently. One possible course is to open the bladder, cauterize all tumors found on thorough search, and into the bases of as many as possible implant one or two "seeds." Following operation, the patient must be cystoscoped at least every three months, and as recurrences develop they may be treated by intravesical measures, either fulguration or radiation.

Certain cases of this type will show too great an involvement of the bladder surface for this method to be employed. In these, the very radical operation of total cystectomy may be considered.

Cystectomy is an operation which should be done, I believe, much more frequently and much earlier than is now the custom. Given an individual in whom the question of recurrence is not a question but a certainty, who has nothing to lose and all to gain, who is in excellent general condition and shows no evidence of metastases, total cystectomy is an operation well worth serious consideration. About three years ago I operated upon a young

man of 29 for tumor of the bladder. A large pedunculated growth upon the trigone was removed and several smaller ones cauterized. The pathologist reported them as papilloma, but they showed necrosis and would, I felt sure, recur. I advised cystectomy, but the patient, not unnaturally, refused. Six months ago he consulted me again for pain in his back and cystitis. His bladder was full of cancer and he had undoubtedly a metastasis in the spine. He died soon afterwards. Cystectomy would have been a long shot for him, but had he gone through successfully he would very probably have been cured.

Last August, W. H., a man of 44, was operated upon for cancer of the bladder. Within three months the growth had recurred in a different part of the bladder; it grew rapidly, and it seemed that cystectomy was the only remedy. The situation was explained to the patient, who was a very intelligent individual, and he decided to take the chance. On January 2 of this year I implanted his right ureter into the ascending colon; three weeks later the left ureter was put into the descending colon. In February the bladder was removed. No enlarged glands or extra vesical extension of the growth was found. Had it not been for a rectal tear which I made in separating prostate from rectum he would have made a perfect recovery. As it was, a fistula resulted which took two months to close. The patient left the hospital early in April with only an occasional leakage through the perineum. Before his cystectomy he passed urine by rectum every three or four hours without discomfort and will undoubtedly do as well again after his fistula is firmly healed. During the time he was under observation in the hospital he showed no sign of renal infection, and his urine contained no pus.

Judd reports several cases of total cystectomy for cancer, one of whom was alive after 12 years.

The operation, in selected cases, will unquestionably save a number of lives and will prolong others in a comfortable condition.

#### CONCLUSIONS.

In this paper I have endeavored to show that all tumors of the bladder (barring some varieties, as fibromata) are potentially, if not actually, malignant; that early diagnosis by means of the cystoscope is the first requisite for successful treatment. Every misbehaving bladder should be considered guilty until it is proved innocent.

The methods of treatment consist of fulguration, radiation by means of implantation of radium, excision of the tumor, total cystectomy, or, in hopeless cases, cauterization and permanent suprapubic drainage. The particular measure or combination of measures selected

depends upon the type of tumor which is disclosed by careful study of the case. The results of surgery in cancer of the bladder are now far from satisfactory; improvement is to be expected only through earlier diagnosis, followed by more radical treatment in some cases, in others by the intelligent use of radium.

#### NUTRITIONAL DISORDERS IN THE LIGHT OF RECENT INVESTIGATIONS.\*

By ALFRED F. HESS, M.D., NEW YORK.

ALMOST every generation or decade has its predominant medical interest. The most active subjects of investigation during the past generation have been those relating to infection. Today nutrition and nutritional disorders have become the central theme of medical interest. It is not difficult to trace the reason for nutrition having secured a position of priority. It was the natural sequence of a series of striking and far-reaching nutritional investigations which disclosed what may be summed up in the phrase "the importance of the minimal." It is unnecessary to recall the various instances where this principle has been found to hold true, and where the current conception of energetics has been shown to be inapplicable. We may cite as examples the essential importance for the animal body of certain amino acids and of traces of iodine. The discovery of the vitamins constituted a further step in this direction, adding fresh interest, as it disclosed an entirely new group of nutritional factors of vital importance for human welfare and existence, and associated with definite and well-established clinical phenomena. The recent war also tended to direct attention to nutrition; indeed, from a medical standpoint the World War differed from previous conflicts in that faulty nutrition and not infectious diseases proved to be its crucial problem. It furnished a demonstration, convincing to all the world, of the dependence of national vigor and health on the food supply. Furthermore, for the first time, governments were compelled to call upon nutritional experts for advice and to grant their decisions priority over those of high executive and legislative bodies. It seemed in place, therefore, before studying a particular instance of faulty nutrition—rickets, the topic of the next lecture—to review critically some outstanding features suggested by recent investigations in this domain. A survey of this kind may have added value as the advance has been so feverish that there has been little time to pause and to reflect.

It is perhaps a commonplace that the most remarkable discovery in the field of nutrition

\*Cutler Lecture delivered at Harvard Medical School, February 14, 1922.

within recent years has been the realization of vitamins and of their essential rôle. The time is not ripe for a discussion of the chemical nature and action of these attractive but elusive factors, but they may well serve as a text to illustrate certain points in connection with nutritional investigations. Before considering them from this point of view I should like to refer to one quality which two of the three established vitamins possess in high degree, and which is of importance in connection with their presence in our food supply—namely, their marked sensitiveness to oxidation. I hope you will pardon also a short venture into the uncharted domain which deals with the fate of the vitamins within the body—for a hypothesis relating to the antiscorbutic vitamin, suggested by its destruction in an alkaline medium.

It has been demonstrated by Professor Hopkins for vitamin A, and at the same time by myself in relation to the antiscorbutic vitamin, that these factors are readily and rapidly destroyed by oxidation.<sup>1,2</sup> For example, if three cubic centimeters of normal solution of hydrogen peroxide are added to a liter of milk, this suffices within a few hours to destroy entirely its antiscorbutic vitamin. Similar destruction results if orange juice or tomato juice is subjected to nascent oxygen. This peculiarity is responsible probably for the loss of potency of antiscorbutic foodstuffs through "aging"—a mere form of oxidation. It accounts also for the loss in the antiscorbutic factor which can be brought about by shaking fluids such as tomato juice. Another application of this principle furnished the explanation of why some found dry milk to retain its antiscorbutic potency, whereas others found it almost devoid of this factor. The milk which was tested in the former instance had been dried by the drum roller process, in the course of which it is subjected to but slight oxidation, whereas the milk which lost its potency had been dried after having been transformed into a fine spray and thus thoroughly oxidized. More recent experiments have shown that vitamin destruction by oxidation can be hastened by means of an addition of small quantities of copper to a foodstuff—by a catalytic reaction. This may be illustrated by the following experiment: Milk pasteurized in a glass container did not induce scurvy when fed to guinea pigs in 100 c.c. per capita amounts, whereas another lot of the same milk, which had been pasteurized in a copper vessel—and contained 1.4 parts of copper per million—induced scurvy when fed in the same amounts. That the disorder was scurvy was evidenced by the prompt curative action of orange juice. When we consider the wide distribution of catalytic substances in food it would seem that this factor may at times diminish the potency of this vita-

mine. The broadest application of catalytic action is probably in connection with the pasteurization and condensation of milk which is carried out in copper vessels and pipes which are coated with a very thin covering of tin. As is well known, these containers are frequently worn, so that the copper comes into direct contact with the milk; in some instances they are not kept thoroughly clean. This is a practical aspect of the food supply which should be investigated further.

Nothing is known of the fate of the vitamins within the body. However, the clinical course of scurvy and our knowledge of the characteristics of its vitamin suggest certain deductions. As you all know, the antiscorbutic vitamin is protected from destruction by the acid reaction of food, and, on the other hand, undergoes more or less destruction when rendered even slightly alkaline, a result which is intensified by moderate degrees of heat. Experiments clearly demonstrating this behavior have been carried out for acid antiscorbutic foodstuffs, such as orange juice and tomato. La Mer,<sup>3</sup> who has studied this question very carefully, was able by the addition of alkali to tomato juice to increase the destructive effect of heat as much as 22 per cent. It is evident, therefore, that gastric juice protects and preserves the antiscorbutic potency of food, whereas a lack of hydrochloric acid tends to destroy it. Have we not here a condition which may prevail in some cases of scurvy which develop in spite of what should be an adequate supply of the specific vitamin? Those who have followed the literature of scurvy must have been impressed by the authenticity of reports of this nature, which have been reiterated for centuries. It would seem a logical explanation of these irregularities that the vitamin has been destroyed within the body by prolonged contact with alkaline digestive juices. These baffling failures of antiscorbutic food have occurred generally in prisons or among soldiers living in damp and unfavorable surroundings, or among troops that were homesick, besieged, or in retreat. In other words, the experiences have involved individuals who were mentally depressed. For some time it has seemed probable that there is a psychic element in the development of scurvy; this aspect can be interpreted in part as due to a suppression of function of various glands in the body, especially the acid secreting glands of the stomach. From the broader standpoint such considerations indicate the range of aspects involved in these problems and particularly emphasize the inherent limitations of animal experimentation in affording a full understanding of human nutrition. A lack of secretion of hydrochloric acid is not the only condition which will tend to destroy the antiscorbutic vitamin within

the body. It is evident that unless this vitamin is absorbed quickly from the alkaline medium of the intestine it will be rendered inert. In the blood it again encounters an alkaline medium; in the tissues it is in addition subjected to destructive oxidative processes. These various conditions warrant the conclusion that this vitamin must exercise its action quickly within the body, and, furthermore, that it cannot be stored in the form in which it is ingested and is known to us. A corollary of these conclusions is that, unless it undergoes a rapid alteration to a more stable chemical state, its action would seem to be functional rather than structural.

One aspect which a study of the vitamins has brought into sharper relief than heretofore is the physiologic difference between man and the lower animals, as well as among the lower animals themselves, as to nutritional requirements. In relation to the antiscorbutic vitamin, man reacts as does the guinea pig; in respect to vitamin B, he reacts like the pigeon or the fowl; and in respect to vitamin A (fat-soluble factor), he resembles the rat. The rabbit, for reasons entirely unexplained, withstands deprivation of any vitamin with comparative impunity, and therefore is not employed in any biologic test for these factors. Furthermore, a diet which leads to a definite avitaminosis in one animal, leads to a quite different one in another animal. For example, a diet of polished rice brings about polyneuritis in the fowl or in the pigeon or in the rat, but induces scurvy in the guinea pig.\* What are we to think of these peculiar vagaries? Are we to attribute them to divergent susceptibilities of the individual species, or rather to varying chemical reactions within the body? Whatever may be the answer, such divergent responses indicate and illustrate the fact that the metabolism of the lower animals and of man present far greater differences than have heretofore been acknowledged. They should caution against the practice of accepting unreservedly, as applicable to man, nutritional experiments which have been performed merely on certain of the lower animals.

Another aspect that the recent studies of vitamins has served to elucidate is that foodstuffs should not be regarded as fixed chemical entities; that they vary greatly according to attendant circumstances. It is true that this was known to chemists from analyses of the inorganic constituents, but its significance was not realized until it was evident how essentially different, from a biologic point of view, a food might be according to its content of vitamins. This distinction was first pointed out in rela-

tion to the antiscorbutic content of vegetables, which may be rich or poor in this factor according to whether they are plucked young or old, or whether they are allowed to age after they have been gathered. Of far greater interest is the fact, which many investigators have helped to substantiate, that the vitamin content of milk depends upon the vitamin quota of the ration of the animal; in other words, that animals are unable to synthesize vitamins. This fact has been demonstrated for all three established vitamins, and its significance and importance are obvious in regard to the diet of the nursing mother, of the cow or of other lactating animal.

We may well consider whether this point of view may not be extended to other constituents, whether the composition of the milk is not dependent on the diet more than is generally believed. For years, probably for centuries, the laity have held to the opinion that mother's milk could be altered by diet and that it could in this way be rendered harmful for the suckling. On the other hand, the tendency of modern medicine has been quite in the opposite direction, so that woman's milk has come to be regarded, from a clinical aspect, as a fixed entity, and its lack of compatibility has been ascribed rather to an idiosyncrasy of the infant. The exception has been the general viewpoint in relation to a varying fat content. Some physicians, however, have remained unconvinced by the negative evidence, trusting to the homely teaching of clinical experience. Of late several studies from the clinic and from the laboratory have led to the conclusion that milk may be rendered harmful by the entrance from the blood of an excess of normal constituents or of foreign substances. One of the most interesting of these reports is that of Shannon,<sup>4</sup> who showed, by means of anaphylactic tests, that egg protein may be present in breast milk after the ingestion of a moderate quantity of egg, and that breast-fed babies may be sensitized to food which the mother has eaten, leading possibly to colic and indigestion. Howe's interesting work showing the absence of englobulin and pseudoglobulin from the blood of newborn calves and its sudden appearance after ingesting colostrum points in a similar direction.<sup>5</sup> Hartwell's experiments on rats led to conclusions of a similar nature. She found that a diet containing a large amount of various proteins—egg albumen, blood albumin, edestin, gelatin, gluten—apparently rendered the milk poisonous and finally checked its flow.<sup>6</sup> The toxicity of the mother's milk was evinced by convulsions as well as by loss of weight. Furthermore, Schick's<sup>7</sup> recent demonstration of what he has termed "menotoxine" in the blood of some women during menstruation recalls the occasional disturbances in nursing infants

\*Darling, whose opinion may be quoted in view of his large clinical experience, writes: "A deficient dietary in a tropical African negro mine laborer causes scurvy; in a Cape Colony mine laborer, mild scurvy; and in some African negroes a diet that causes scurvy in one set of men causes neuritis in others."

which have been attributed by the laity to this association. The cells of the mammary gland do not seem to possess the power of protective filtration with which they have been credited. Viewed from our knowledge of vitamins and other recent investigations, it would seem that milk is a far more varied biologic product than we have been wont to believe, both in regard to its physiologic and its pathogenic constituents.

One of the commonest fallacies is considering and designating the vitamins, particularly vitamin A, as growth factors. It is true that vitamins are especially needed during the growing period, as shown by their great abundance in young plants. There is, however, no single factor or group of factors to which this attribute should be applied. And it is well for man that this is so. In a particular instance an essential amino acid or an inorganic salt may prove to be the growth factor. I should like to illustrate this point by some recent experiences which have made it seem possible that a lack of iron may lead not only to anemia in infants but likewise to marked retardation of growth. In the case of some infants whose diet consisted of milk, but in some instances also of cod-liver oil, of orange juice and even of yeast—in other words, the three established vitamins in their most concentrated forms—no growth came about for many weeks. When, however, as little as two teaspoonfuls of spinach were added to the diet daily there was a prompt response of the

growth curve (Charts 1 and 2). McClelland and Sedgwick<sup>8</sup> and also Berman<sup>9</sup> have reported similar experiences. In these cases, had we not been supplying the vitamins in adequate amount, the sudden gain in weight might well have been interpreted as the result of the vitamins supplied in the spinach. This criticism is applicable to recent investigations on the effect of yeast on the nutrition and gain in weight of infants. Following the addition of the yeast to the dietary the infants gained, and it has been therefore concluded that this gain signified a former lack of water-soluble vitamins. But it was not evident that the dietary had been lacking in this vitamin. My own experience in this regard, embracing a large number of observations, has been that infants frequently gain in weight following the addition of yeast to the diet, apparently irrespective of its previous vitamin content.

There is a growing tendency to adopt the point of view that we have reached a point where we possess a knowledge of all the elements which go to make up an adequate and complete diet, and, accordingly, that our future task is merely to ascertain the absolute and relative amounts of these constituents required under various conditions. The problem is, however, by no means so simple. There are probably many reactions and interactions which have not been considered. I should like to illustrate this point by the *unexplained rôle which cereal plays in the nutrition of the infant*, a phenomenon which has interested me for some time and well illustrates the complexity of dietary problems. Not infrequently infants receiving milk mixtures which should suffice to bring about growth, fail to gain until cereal is given in addition; the babies are generally over six months of age. In our experience, cereal in the form of farina has proved effective where cod-liver oil, egg yolk, beef drippings, or autolyzed yeast has failed (Chart 3). The diets were in some instances rich in fats or carbohydrates, in some they consisted of breast milk. There would be nothing surprising in the fact that an addition of cereal brought about a gain in these babies were it not for the insignificance of the amounts which were able to accomplish this result. The beneficial result could not be attributed to a simple caloric increase of food, for only two to three grams of the dry cereal were given, representing but a slight addition in calories to the dietary. Hopkins<sup>10</sup> reports observations on rats which probably are of a similar nature. He found that after a certain period rats failed to grow on a milk diet. An addition of ferric ammonium citrate or of hemoglobin failed to bring about growth, but when bread was added to the dietary growth recommenced. Recently Mattill and Conklin<sup>11</sup> have reported a failure to bring about continued growth in rats on a

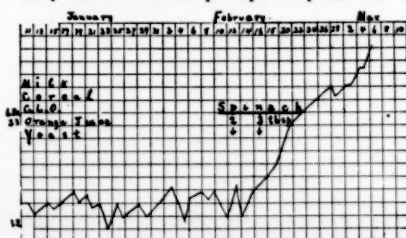


Chart 1.—Growth following the addition of small amounts of spinach to the diet.

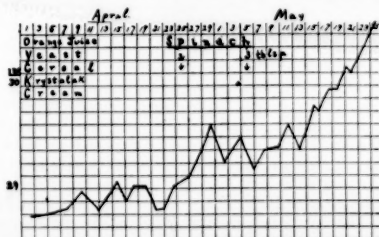


Chart 2.—Growth following the addition of small amounts of spinach to the diet.

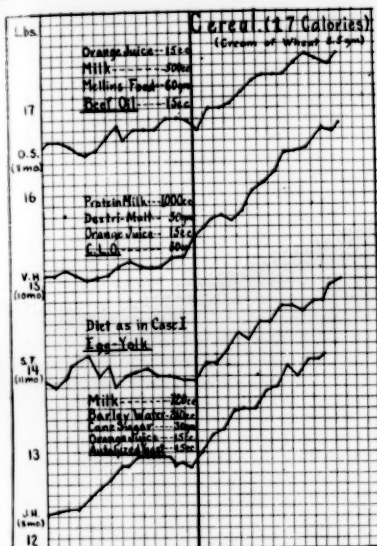


Chart 3.—Four cases which reached a stationary phase in weight, and where gains were brought about by small additions of cereal to a diet which was adequate in caloric content. The first three diets were unusually rich in fat-soluble vitamins, and the fourth in water-soluble (autolyzed yeast). In the last case (J. H.), 4 gm. of dried cereal, equivalent to 28 calories of food, were added.

milk diet, but success when flour was added, and therefore came to the conclusion that other foodstuffs, in particular starch, provide a requisite which milk does not possess. Osborne and Mendel<sup>12</sup> were able to raise rats to maturity on a diet of milk powder, starch and lard. There is no adequate explanation for this phenomenon, but in studies on animals and on man a rise in the weight curve which cannot be explained according to our present knowledge should not be regarded as being the result of a lack of established or of undiscovered vitamins.

Another point which has not been sufficiently considered in animal experiments is the importance of the physical texture of the diet; whether the food is given in the form of powder, fluid or paste; whether it is coarse or finely divided. If we are to judge by the recent experiences in infant feeding the physical state of the food is of great importance in deciding its nutritional value. The superior value of dried milk over fluid milk, in many cases, is certainly partly attributable to physical changes brought about by desiccation. That this factor plays a rôle also in the nutrition of our experimental animals was made evident to me some years ago when attempting to feed guinea pigs small amounts of cod-liver oil.

All attempts to make them tolerate even a few drops of this oil met with failure; they promptly developed malnutrition and died. Rats, on the contrary, tolerate and thrive on far larger amounts of cod-liver oil. The recent experiments of Hart, Halpin and Steenbock<sup>13</sup> on leg weakness in poultry showing that paper, in a concentration of 10 per cent. of the ration, was effective in preventing the progress of this disease when added to a synthetic ration has, no doubt, a wider application in animal and human nutrition.

Before leaving this phase of the subject, I should like to refer briefly to an aspect which is well known to the children's specialist and to other clinicians, but is rarely considered by the laboratory investigator of nutrition. I refer to the opposite of disorders due to deficiency, to disorders resulting from an excess, from an oversupply of one or more dietary factors. It seems quite possible that experiments, which, under the prevailing point of view, are judged solely by the criterion of an adequacy of the various food elements, may be more correctly interpreted as due in part to an oversupply of some factor. For instance, we all know that infantile rickets frequently occurs among overfed babies. In experiments on rickets is it entirely inconsequential in regard to the absorption or retention of the essential inorganic salts how great the fat or the protein content of the various diets may be, and, furthermore, in what form these organic constituents are fed? Experiments on rats, which I shall discuss elsewhere, would seem to show that increased protein plays a rôle in this connection. In other words that an excess of some food constituent may lead to a result similar to that brought about by a deficiency.

It is only recently that we have come to appreciate the dominant rôle of latent phases of malnutrition, to realize that we have to deal mainly with disorders of nutrition and not with nutritional disorders. Rickets, scurvy, beriberi, and similar nutritional disturbances of gradual development and slow onset, occur far more frequently in their latent undeveloped forms, than in the dress which we have been accustomed to clothe them. The very fact that scurvy takes months to develop before reaching a stage where it can be recognized, indicates that the number of larval, unrecognizable cases must far outnumber those which can definitely be diagnosed. The same is true of rickets. This realization indicates a marked advance in our conception of the nutritional disorders and will, undoubtedly, change current viewpoints in many respects. When we shall have devised methods to perceive those invisible parts of the spectra of pathological conditions, we shall undoubtedly find them far more prevalent. We may thus be led to the conclusion that their

relative incidence and their geographic and sociologic distribution is different from what we have been wont to believe, having merely the frank and full-blown pictures in mind. Indeed, we are already faced with the difficulty which will increase as time and knowledge advances, of deciding what phenomena justify a diagnosis of certain well-established nutritional disorders. I believe I reflect the opinion of many workers in this field, in stating that their is an increasing uncertainty in this regard, both among clinicians and laboratory investigators. What is to be regarded as scurvy, rickets, beriberi, pellagra, etc., and what is not? As a matter of fact, we all realize that normal nutrition imperceptibly merges into abnormal nutrition. Today we are far from being able to detect nutritional derangements at their earliest beginnings—they have progressed to a marked degree before we finally recognize them and dub them with a definite name such as "rickets" or "scurvy." We constantly have to shift our outposts toward the realm of the normal—arbitrary outposts designating a fictitious boundary between the normal and pathological. It is evident that this trend is leading us unconsciously and little by little away from a consideration of what we now term disease. It is also leading us from curative medicine into the domain of preventive medicine. At present preventive medicine has not advanced sufficiently far to concern itself merely with the preservation of normal physiologic conditions, but includes a large number of mild and latent forms of disturbances.

Those of you who have been following the experimental work in this field will have noticed numerous altered viewpoints which have become increasingly evident during the past few years. It may be well to refer to these newer aspects as, in a measure, they are applicable to human nutrition. Only a few years ago it was considered sufficient to ascertain the effect of a diet for a period of weeks or of months. Today, largely as the result of the investigations of McCollum and of Osborne and Mendel, we know that to regard a diet as completely adequate the observational period must extend at least to the stage of maturity—the animals must grow at a normal rate, must be able to reproduce at frequent intervals, and successfully to suckle their young. More than one generation may have to be followed as a deficiency becomes apparent at times only in future generations. The necessity and wisdom of a survey of a larger span of life was clearly demonstrated in the case of the peoples of the Central Empires during the war. Had the war lasted but two or three years the effect of the inadequate ration would not have been apparent; it required three or more years of a diet, which was insufficient in numerous

particulars (adequate protein, vitamins, phosphates), to bring about unmistakable signs of malnutrition. Furthermore, it is interesting to speculate as to the future course of the growth and development of these children. Will the new generation be of a stature smaller than the present population, or will a belated adequate ration bring about an increased increment of growth? Will this increase come about at once, or will it be deferred until the added growth impetus of maturity?

Not only have we constituted a longer span of life, as the nutritional unit, but we demand special recognition of the various life cycles. The period of active growth is considered a definite entity. It has been found necessary to make still finer distinctions; for example, rickets experiments performed on rats, weighing 30 to 40 g., are recognized as not comparable to those undertaken in rats a fortnight older, weighing 60 to 70 grams. These differences are not merely quantitative to be calculated according to variations in body weight, but are distinctive for the particular period of life; so that an animal during its period of active growth is almost as distinct from the adult animal as if it belonged to a different species. It possesses differences in susceptibility and immunity to the nutritional disorders.

The main factors determining the nutrition of the body are *diet and environment and infection*. This is the triad, which, working hand in hand, or at cross purposes, brings about a physiologic or a pathologic state. It is impossible to give these three factors their relative values, as this varies according to circumstances. Studies of the deficiency diseases have served to illustrate in a manner, more convincing than heretofore, the intimate relationship and interrelationship of nutrition to infection, and have led to our attributing increased significance to nutrition in this regard. Indeed, the chief clinical importance of disorders of nutrition in times of peace and plenty is their effect of so altering the tissues as to render them more susceptible to the invasion of bacteria or toxic products. Clinically it is by no means easy to determine the respective rôle of infection and of nutrition when confronted with disease. Either can result in secondary involvement by the other. There is in my opinion no more common error in considering nutritional disorders in infants, and in judging the merits and demerits of particular foods or food preparations, than attributing failure to the diet where it has been occasioned by mild infection. This is due largely to the conception that infection must be accompanied by a rise of temperature. That this is not so may be illustrated by instances of the mild infectious diseases such as chicken-pox, where a cessation of gain in weight may occur in infants

without any rise of temperature. It is evident also following vaccination, where a stationary weight may precede by a day or two the febrile reaction of vaccinia. This interrelationship of infection and nutrition was exemplified in 1913, when, as the result of a diet of pasteurized milk, latent scurvy developed among a group of infants under my care. This scorbutic taint was followed by a widespread grip infection, with hemorrhagic skin manifestations, which disappeared only in part on the administration of orange juice. For some years it was difficult to know how to interpret this peculiar clinical picture, whether to regard the epidemic as due to scurvy, or to infection. As the result of subsequent experience I realized some years later that it had been due to both causes—the result of a primary nutritional disturbance and a secondary bacterial invasion. It is probable that the overt and classical signs of scurvy—those which are described in the textbook—for example, the hemorrhages of the gums, are not always purely scorbutic or nutritional, but the result of the secondary infection which comes about, sooner or later, in conjunction with this disorder.

The third factor which markedly affects nutrition is environment, which includes the air we breathe, atmospheric conditions, our shelter, clothing, and many other apparently trivial factors connected with our daily life. Here is a field which lies almost untouched, and which, undoubtedly, will prove most fertile. It is one which has been ignored in a consideration of many questions of nutrition. For example, the diets of peoples living in various countries, under divergent climatic conditions, are frequently compared without considering for a moment the possible influence of environment. It is not permissible to compare the dietaries of the children of New York, London, Edinburgh, Dublin, etc., and to interpret their comparative nutrition as if they were all living in the same city. The very fact that the infant mortality—perhaps the most delicate indicator of environmental conditions—of London has been low for many years, in spite of a wretched milk supply and inadequate educational propaganda, indicates the rôle of non-dietetic influences. The effect of environment on plants is well known and may be illustrated by an interesting experiment carried out by the United States Department of Agriculture some years ago. The growth of a certain strain of wheat which grew particularly well in Kansas was tested in California. To this end carloads of the Kansas soil were transported to California for sowing of the seed. In spite of the fact, however, that soil and seed were the same, the yield in California could not be made to equal that of Kansas. There is a

real and growing danger of forgetting these environmental factors in gathering statistics of the geographic distribution of disorders of nutrition, such as rickets, caries of the teeth, etc. Still greater care must be exercised in interpreting the influence of diet on races which lived centuries or thousands of years ago. To draw inferences as to the effect of diet from the condition of the bones of the teeth of the Egyptians, as has been done, is to leave out of consideration differences in dress, in housing, in habits, and perhaps changes in climate, which may well have had their effect on the nutrition of the tissues.

One of the most important factors included under the broad term of environment is the solar rays—light. The peculiar beneficent effect of light was appreciated in far distant ages and led to the worship of the sun, a cult by no means to be belittled when compared with the present-day cult of patent medicines. Hippocrates and Herodotus praised the healing virtues of the sun, and the Romans took sun baths on the flat roofs of their houses. Antylus, who lived 300 years after Christ, minutely described the indications for the sun bath with and without anointing the body. During the Middle Ages the knowledge of the curative value of the sun seems to have been forgotten. About 50 years ago sun treatment was with difficulty introduced for the cure of tuberculosis and has been carried out with signal success by Rollier in Switzerland. It is strange that the value and need of the sun's rays have not been more fully appreciated when we consider that it has been generally acknowledged by all physiologists that the solar rays are necessary for the proper growth and nutrition of green plants. On the part of physicians this lack of confidence probably is associated with a corresponding overconfidence in pharmacologic preparations, and has been intensified by the fact that heliotherapy has been practised largely by those whom the state did not license to employ accepted methods of therapy. That the physiologists should not have directed the attention of physicians to the potency of this measure shows a lack of appreciation also on their part of the value or the necessity for the animal organism of the sun's rays. From a physiologic viewpoint it would seem that this function of the skin to absorb the effective rays of the sun is comparable to that of the intestine in relation to the constituents of the food—a comparison perhaps the more permissible in view of the similar embryological origin of the integument and the lining of the intestinal tract. Today we know by means of subjective and objective clinical examinations, as well as by animal experimentation, that the sun's rays are able to prevent or to cure rickets; that, indeed, this form of therapy may be regarded

as a specific for this disorder. In my lecture of tomorrow I shall discuss the subject more fully as to the rays which exert this remarkable effect, the influence of pigmentation, the sun's action on the chemical constitution of the blood, etc. It would seem that the action of the sun's rays will have to be taken into account in metabolism studies on animals and on man which concern themselves with the body exchanges of the inorganic salts. From the general standpoint of animal nutrition must we not qualify the usual statement that adequate protein, inorganic salts, the vitamins, water, etc., suffice for nutrition of the animal body, by adding that sunlight must also be provided? This holds true at least for the young, rapidly growing animal.

Before leaving this interesting subject of the effect of solar rays on animal nutrition I should like to mention a clinical observation which suggests that certain constituents of the food may influence the effect of the radiations. A few years ago Myers and <sup>14</sup> showed that if an infant receives a moderate amount of a food rich in carotin pigment—for example, carrots or spinach—it frequently will develop carotinemia. This condition is quite innocuous and is characterized by carotin in the blood and a discoloration of the skin resembling mild jaundice. Infants having carotinemia are peculiarly susceptible to the sun's rays, the skin having been to a certain degree sensitized, so that the face becomes rough and irritated when exposed to the sun. This condition recalls, in a minor degree, the susceptibility of the skin of rabbits to which eosin has been given. It suggests that other foods or that drugs may act in conjunction with the solar rays.

Nutrition is embracing a broader scope, and its studies both in the laboratory and in the clinic, and in the world at large, will more and more include a consideration of environment. The effect of atmosphere both out of doors and indoors will have to be carefully studied, and may be found to include factors hardly considered at the present time. Such studies have just begun and can be seriously attempted only when we are able to control some of the factors which comprise climate. This will be no mean task. In closing this consideration of the rôle of environment on nutrition the effect of season must be considered. It is well established that season affects the growth of animals and that children grow more rapidly during certain seasons than during others. The reason for this is not known. Very few studies of the effect of season have been attempted in the laboratory. One of the earliest and most interesting was that of Reid Hunt<sup>15</sup> which showed that guinea pigs are decidedly more resistant to acetonitrile poisoning

in the spring and summer than in the winter, and that this is probably associated with some seasonal variation in metabolism. Those who have carried out nutritional studies for a series of years must feel that there is possibly a seasonal factor which accounts for certain variations in results occurring under apparently identical conditions. The intimate and clear relationship of season to disorders, such as tetany and rickets—quite apart from its influence on the various infectious diseases—well demonstrates the dominant note which climate may exert in our nutritional state. The three main factors in nutrition—diet, infection and environment—probably are so inextricably bound together that it will be impossible to appraise the rôle of each in the disorders of metabolism in which they are concerned.

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## SKIN IRRITANTS: EXTERNAL AND INTERNAL.\*

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THIS paper deals, first, with certain irritated conditions of the skin definitely resulting from contact with various substances, that is, dermatoses of external origin; and, secondly, with certain eruptions on the skin which are of internal origin, that is, from the taking in of certain substances, or because of the formation of certain substances in the body. It does not include the infectious conditions, either bacterial or parasitic.

Both of these subjects are fundamentally connected with the subject of idiosyncrasy. Idiosyncrasy is defined as an abnormal body response to a certain substance. It is an individual susceptibility, a natural or an acquired sensitiveness of the skin to some particular reagent. These two groups of cases are to be explained on the grounds of an individual sus-

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ceptibility of the patient's skin to a particular substance. They are evidences of an unusual response on the part of the skin to substances which may cause no reaction by an average individual. I realize that this explanation does not give a scientific answer for the cause of these conditions, but it is as good an explanation as any that can be given at the present time. It is theoretically possible that for any given chemical there may be an individual who is susceptible to this agent, and if the list of substances causing such conditions is considered the theory seems almost a reality.

#### GROUP I. THOSE FROM EXTERNAL SOURCES.

This first group of cases, those from external sources, includes the very large number under the diagnosis of dermatitis and dermatitis venenata, the common garden variety of skin eruptions which we have all seen in practice. Let me further classify these cases under the following headings: (1) Those from plants, etc.; (2) from medicinal applications; (3) from occupation; (4) from an intent to deceive; (5) from accidental contact.

*Class 1. Plants.*—The type eruption of the first class, those from plants, is usually thought of in connection with poison ivy, varying from erythema to the formation of vesicles and bullae, with marked itching and burning, etc.; and later with sealing, perhaps becoming much eczematized. One is apt to think of dermatitis venenata as including only ivy as a cause, and to forget there are other substances causing similar eruptions. I have recently reviewed at the Massachusetts General Out-Patient Department some 600 records in which there was a diagnosis of dermatitis or dermatitis venenata. There were only about 10 per cent. of these cases whose history included an exposure to woods or ivy. I had thought that the percentage would be higher. These cases are familiar to all of you.

I want to call attention to one member of this group which is becoming a more frequent cause of such a dermatitis. I refer to the primrose, and especially to the one to which the name *primula obconica* is given.

In this connection, I recall especially a woman of 42 who was referred to me in the X-ray Department for treatment of an eruption on her hands. For several months she had had a patchy, erythematous eruption on hands and face, with occasional tiny vesicles and linear lesions which attracted my attention. Inquiry developed the fact that she possessed a primrose, and coincident with throwing away the plant the eruption faded away. It is needless to say that no x-ray treatment was given.

In the treatment of these cases the majority will clear up with the use of the familiar whitewash of carbolic acid, zinc oxid and lime

water. Strickler<sup>1</sup> has treated a series of ivy cases by the subcutaneous injection of a toxin developed from the plant, and marked relief has been obtained in his cases much more quickly than with the ordinary treatment. This toxin, however, is not yet on the market for general use. Schamberg<sup>2</sup> has called attention to the use of tincture of rhubarb given by mouth, not only in the treatment of, but also as a means of prevention of poison ivy dermatitis.

*Class 2. Medicinal Applications.*—In these same 600 cases of which I have spoken there were many with no cause given, but it was rather striking to find so many cases in the second class, that is, the eruptions following the application of medicinal agents. There were 20 per cent., or one in five, who had a history of applying some ointment, liniment, iodine, etc., to the body surface, with the resulting development of a dermatitis. I realized that there were many patients in this group, but did not imagine that it was quite so large. This irritation has usually resulted because the individual has taken it upon himself to prescribe for his own condition. A certain number have received medicines from the druggist, local physician, and the Out-Patient Department.

We are all seeing such cases continually, and it seems to me that the moral is to be careful in the treatment of acute skin conditions to use soothing treatment, and to use extreme care in the prescription of the stronger drugs and applications. The list of substances is a long one, perhaps the most common ones being iodine, sulphonaphthol, sulphur, mercury ointment, liniments and patent medicines. The story in these cases is usually clear, and the treatment is to forbid further application, and the use of a wash similar to the whitewash before mentioned.

Among these cases resulting from too strong treatment I want to say just a word about scabies. The number of individuals infected with scabies has shown a marked increase in the past two years. There are many more individuals being treated and there are many who think they have scabies, and there is a much more common use of sulphur. It is a fact that 4½ per cent. of these 600 cases, or almost 25 per cent. of those from external sources, had an irritation probably due to the use of sulphur in some form or other. This bears out, in a way, the experience which I had in the army with scabies, where I saw many cases of sulphur dermatitis from the use of sulphur ointment, especially by the boys themselves over a considerable period of time. Sulphur dermatitis is an obstinate condition. It is often as bad as the original scabies. It further complicates the picture and often makes it difficult

to determine whether the scabies is cured. It is often necessary to apply a soothing lotion or ointment to quiet down the dermatitis before the scabies can be treated.

*Class 3. Occupation.*—Among these 600 cases there were 11 per cent. which were industrial in origin, or probably industrial. It is often difficult to decide absolutely in these cases, but I have included only those in which there was a strong possibility. There are many different causes among these cases. Perhaps the greatest number of patients were housewives, or individuals doing housework. We are apt to forget, I think, that housework, with its soap and water, polishes, cleaners, etc., may be the cause of much disability and annoyance, to say nothing of actual suffering in many cases.

In the shoe factories and other factories, the mills, stores, tanneries, machine shops, etc., many and varied chemicals are used; and with closer attention centered on this subject, with the development of industrial hygiene and factory work, many more cases will be found. There is often need of real detective work in searching for the offending substance, but the only solution is the elimination of the substance causing the disability. That is the proper treatment fundamentally. The majority of the acute cases will then clear up fairly readily with a soothing lotion and mild ointment, such as Lassar's paste, or zinc oxid ointment.

I have been much interested in the preventive work which has been done in two industries, namely, among printers and among vulcanizers. Among printers,<sup>3</sup> certain of the pressmen develop an eruption on forearms and hands from contact with the inks, with benzine, and from the various methods used in removing inks from the hands. A good deal of experimental work was done on these individuals and it was found that the application of an oily mixture composed of lanolin and oil before going into the pressroom, and the use of a mixture of sawdust and a liquid soap for cleansing purposes, was sufficient to prevent the greater part of these eruptions.

In some of the rubber factories certain of the vulcanizers who were using hexamethylenamine in their work developed an eruption on hands and forearms. Without going into an explanation of the research work involved, I will state that the chemists of the Firestone Rubber Company<sup>4</sup> found that the immersion of the exposed parts in an alkaline solution, such as a saturated sodium bicarbonate solution, before going to work, was sufficient to prevent this eruption from appearing in those individuals who were sensitive. Examples of cases in this group are numerous.

I recall the case of a photographer's assistant with a very marked oozing, red and crusted skin on hands, forearms and neck, probably

from contact with the chemicals used in developing.

I also recall the case of a machinist working without any sleeves, and with overalls practically saturated with oil. This man showed a very marked folliculitis on both arms and thighs, due to the action of the oil.

Cases in our own profession, among nurses and physicians, from the use of antiseptic solutions of one kind or another, are familiar to all of us. Among dentists are found individuals who are susceptible to novocain, with the result that they have at times much disability from irritated conditions upon the hands.

*Class 4. Intent to Deceive.*—In the fourth class I wish to mention those cases of dermatitis which are artificially produced by the individual with the intent to deceive. These eruptions occur among malingerers, neurotics, individuals who desire sympathy, or who desire to be free from certain work, or desire to gain admission to hospitals, etc. There are many agents, physical and chemical, which are used to produce these eruptions. They usually present weird combinations of dermatological lesions, and the very strangeness of these combinations often leads to the discovery of their cause. These patients are oftentimes very hard to handle and much patience and tact are necessary in dealing with them.

*Class 5. Accidental Contact.*—Finally, in the fifth class of these eruptions I am including those cases from accidental contact—the unusual, infrequent cases which do not come in any of the other groups. These cases are often a real puzzle picture and there is need of more of the same detective work which I have mentioned before. The list of substances in this group is very large. It is stated that one physician has a series of 500 cases in each of which a different substance has been the exciting cause. Some idea of the variety can be obtained from the following partial list occurring in these 600 cases: Match box, fur, citronella, wool, hair dye, hair tonic, etc. The following cases will give an idea of this group:

A man, 35 years old, presented himself with a red, infiltrated, rather sharply defined patch on the anterior surface of the right thigh, giving a history of three different similar attacks appearing in much the same area, with intervals of clear skin between attacks. The source of the trouble was finally located in the match box which this patient habitually carried in the right-hand trousers pocket.

A woman, 32, was seen recently with a bright red, papulo-vesicular itching and burning eruption on neck, face and hands. The eruption was sharply circumscribed at its lower border on her chest, coinciding with the upper edge of her dress. She had recently bought a new fur coat; she had worn it several times for

short periods; and on the day of the appearance of this eruption she had worn it to Worcester in the cars, a matter of two hours. Itching and burning had started on that same evening. This dermatitis was undoubtedly due to the dye used in the fur coat. The eruption cleared rapidly in three or four days and since that time she has had two slight attacks, but has finally come to the conclusion that it is necessary to give up the fur coat.

A woman, 42, giving a story of having her hair dyed occasionally, appears with a red, oozing, crusted eruption on forehead, ears and neck, with patches scattered through the scalp: a few small areas on fingers; with a story of having hair dyed two days previously. This case is undoubtedly due to the dye used on the hair.

I am also including in this group some cases which recent research work has demonstrated should be included in this category. I refer to the babies having a dermatitis in the diaper area, this dermatitis usually being associated with an ammoniacal odor. Cooke<sup>5</sup> of St. Louis has demonstrated that this effect is due to a Gram-positive bacillus in the stool which has the property of fermenting urea and producing ammonia, with the resultant irritation on the buttocks. Without going into the detail of the experimental work, Cooke found that impregnating the diapers on the last washing with some antiseptic, such as mercury bichlorid, 1:5,000, or boric acid, 1:20, and drying the diapers, enough antiseptic remained in the cloth to inhibit the action of the bacillus and cause disappearance of the odor and the consequent clearing of the eruption. This is a comparatively recent piece of work and, I believe, will help us in giving relief to many of the babies who have bothered us so much in the past.

In this series of 600 cases there is one other condition which is confused with dermatitis venenata. I refer to the parasitic group. We are finding that many of the vesicular eruptions on the hands and between the fingers, especially where the areas tend to be sharply limited and to affect the web of the fingers, are associated with the fungus found in the ring-worm of the crotch—*tinea cruris*—commonly known as "red flap." It affects the feet and hands and crotch usually, or any one of these, and on the hands may suggest the picture of dermatitis venenata or eczema. I found that in 2 per cent. there was a question of dermatitis venenata and parasitic infection—epidermophytosis. This latter infection is often a very obstinate one and requires vigorous treatment. We often use a combination of acid salicylic, 2; acid benzoic, 4; in adipis benzoat, 30; or 1:5,000, a potassium permanganate solution; or chrysarobin, 2 per cent., in these cases, but many are very resistant to treatment.

#### GROUP II. THOSE FROM INTERNAL SOURCES.

In speaking of the second group of dermatoses—those of internal origin—there is without question the same relation between these cases and individual susceptibility. The most frequent example of this condition is found in the condition commonly known as hives—urticaria. This is usually associated with the ingestion of some one particular type of food, or a certain group of foods. We see the same condition following the administration of serum not infrequently.

In the acute type, diagnosis is usually easy, and it is often fairly easy to detect the offending article and caution the individual in regard to its use. These cases usually clear up with the use of a saline, restriction of diet, and the use of a soothing lotion to relieve the itching. As a routine, we are apt to use calcium lactate in most of these cases. The acute type often responds to a hypodermic injection of adrenalin, at least temporarily, and there is, at times, very marked relief following its use. In some of the others, emetine hydrochloride is used, but I am not as familiar with the use of this drug.

The chronic persistent types, particularly the chronic papular urticarias in children, are often a very great test of one's patience and of one's knowledge of therapeutics. Hazen has found that a certain number—in fact, about one-third in his series—had a positive Wassermann, and that in these the symptoms disappeared coincident with antisyphilitic treatment. He further found that a large number of them were undoubtedly associated with focal infections, such as tonsils, teeth, etc. It is possible that in a number of others some one particular food is at fault, and further attempts to detect this food element, if possible, should be made. In some of these cases the French are using more and more, according to the literature, powdered peptone, taken before meals, to aid in the desensitization process. In certain other cases the injection of a foreign protein, such as a typhoid vaccine, seems to act as a desensitizing agent.

In giant urticaria, often called angioneurotic edema, the condition may at times become serious because of the tremendous swelling about the face and neck, sometimes involving the epiglottis. At such times it is well to have adrenalin at hand for use in the event of an acute crisis.

I want to mention, in passing, toxic erythema, and the serum reactions to which I have just referred. The former are more frequently seen in children, and in many of these it is a matter of differential diagnosis from scarlet fever. In the latter are seen the cases which are examples of real anaphylaxis.

There are certain other cases classed under the diagnosis of eczema or pruritus, or under the chronic urticaria of which I have spoken before, which I believe can be included in this group of dermatoses. I refer to those cases caused by the absorption of some food element which affects only a comparatively few individuals susceptible to that particular food element. It is now being found that a number of these cases are a reaction on the part of the skin to some one particular food element. This condition is seen most often in children. For example, in a recent series of eczema in breast-fed babies, it was found that there were 40 per cent of apparent cures, and 20 per cent. showed improvement following the elimination of food in the mothers' diet to which the babies were susceptible.

These cases of sensitization are most frequently found in connection with egg albumen, but cases are on record of sensitization to other substances, such as pork, potatoes, carrots, tomatoes, etc. Occasionally there has been reported a real collapse, that is, a real anaphylactic reaction caused by the use of egg albumen.

A middle-aged woman for six months had rather generalized itching, many excoriations, and areas where the skin was much eczematized. She had noted an increase of symptoms after eating tomato, and skin tests on her arm showed a reaction to tomato. She has been well since omitting tomatoes from her diet.

There is also the case of a man of 43 who had had pruritus ani for three years, showing much eczematization from scratching. He was found to give a reaction to pork, and his condition cleared with the removal of this article from his diet.

I have been speaking of the skin tests. These occasionally give a valuable clue, but I feel that the value of this test, like many others, is overestimated. It may, however, give valuable information. Like the Wassermann or Widal test, a negative reaction means nothing. A single positive test standing out among a group of negative ones may mean a great deal. The treatment of these cases, of course, consists in a search for the offending substance and its elimination from the diet. So far as I know there is no method of desensitization in these cases.

Let me also mention the pruritus and eczema occurring in diabetes. This is occasionally the first symptom of a diabetic condition, and some work has been done showing a high-blood sugar, or a low sugar tolerance in certain of these cases, especially in the pruritus and eczema of the perineal region.

The last group of cases to which I wish to call your attention includes certain drug eruptions. We see rather commonly eruptions fol-

lowing the ingestion of certain drugs, perhaps more commonly after the use of bromide and iodide, but it is only of two or three of the newer drugs of which I wish to speak now.

Luminal is one of our new hypnotics to take the place of bromide as a sedative. Recently at the Massachusetts General Hospital we have had four cases of an eruption associated with the use of luminal, which has served to impress this fact upon our minds. This eruption has been a widely scattered, bright red, macular eruption, the individual elements being small, irregularly shaped macules.

Phenolphthalein\* is another drug of which an increasing number of cases are being reported. I have always thought that this drug was not absorbed but had some mechanical action upon the mucous membrane. There are, however, certain individuals who are susceptible to it. The eruption in these cases shows widely scattered, irregular, bright red, or even purplish plaques, which show some infiltration. The pigmentation often persists for a considerable period of time afterwards.

Arsphenamin and neoarsphenamin are two other drugs by which an eruption may be caused, this eruption consisting perhaps of a few red macules on forearms and legs, or of an exfoliative dermatitis in some cases.

In concluding I want to give just a word of caution in regard to other forms of arsenic. It is because I have seen rather recently two or three cases of skin change due to the ingestion of arsenic over a long period. There appears the arsenical keratosis of palms and soles, which is seen most commonly. There occasionally appears the generalized arsenical pigmentation. Furthermore, there appear the small, scattered, seborrheic, scaly areas which are not unlike the keratotic areas in elderly individuals which later develop into epithelioma. I feel that these words are not uncalled for, because of the fact that arsenic is prescribed so often for all sorts and kinds of skin conditions.

Finally, I wish to cite, as an example of both of these groups of cases of which I have been speaking, a case of rather extreme sensitization to various factors.

It concerns a man of 24, who was a painter by trade before entering the army. In the army he had a scabies for several months, and apparently had considerable treatment. He appeared at the Out-Patient Department with rather a marked eruption of scabies and was given our usual treatment and directions. Three days later he returned with a very marked dermatitis venenata from the application of the ointment. At the end of a week he returned and his scabies had gradually faded out, but certain areas suggested a macular eruption of syphilis. Further examination showed a primary and mucous patches in his

mouth, so that a diagnosis of syphilis was made. He had one dose of arsphenamin on that day. Two days later he was admitted to the hospital with a generalized exfoliative dermatitis, undoubtedly due to the arsphenamin. This cleared gradually and he was discharged from the hospital. He attempted to resume work as a painter, but after each of five attempts an erythematous and finely papular eruption appeared on hands, face and neck.

This is one of the most marked cases of individual susceptibility which I have seen and illustrates very well the subject under discussion this evening.

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## TREATMENT OF FRACTURE INVOLVING LOWER END OF RADIUS WITH ANTERIOR AND POSTERIOR WOODEN SPLINTS.

BY T. K. RICHARDS, M.D., BOSTON.

MOST of the functionally poor results following fractures involving the lower end of the radius are due to two causes: first, improper reduction; second, too long fixation. It is not the purpose of this paper to discuss the former but to outline a plan of treatment using an-

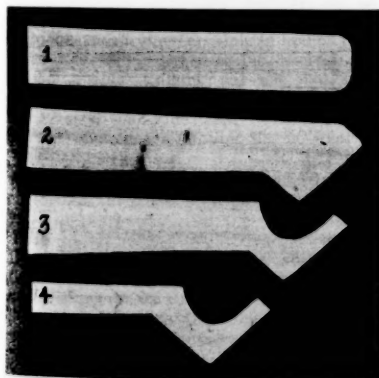


FIG. 1.—1, Straight board used as a posterior splint. 2, The usual posterior splint. 3, The anterior splint. 4, The cut-down anterior splint.

terior and posterior wooden splints which gives good results functionally.

The first essential in treatment of these fractures is to break up the impaction. Then the fragments must be immobilized. To do this with as little immobilization as possible to the nearby joints—the carpals, metacarpals and phalanges—is desirable. To accomplish this the following points about cutting the splints are all important (Fig. 1).

Place the good arm on a piece of splint wood with the hand ulnar flexed and mark the following seven points:

1. The radial side  $1\frac{1}{2}$  inches below the internal condyle of the humerus.
2. The ulnar side  $1\frac{1}{2}$  inches below the internal condyle of the humerus.
3. The radial side outside the first metacarpal-carpal joint.
4. The radial side inside the first metacarpal-phalangeal joint (between the thumb and index finger).
5. The radial side just proximal to the second metacarpal-phalangeal joint (this point is well down in the palm of the hand and not near the base of the fingers).
6. The ulnar side just proximal to the fifth metacarpal-phalangeal (here again the point is well toward the heel of the hand).
7. The ulnar side just distal to the styloid of the ulna (this point should be the width of the bones, not the width of the arm, from No. 3).

The radial side of the arm is straight so the splint need not be cut along this edge. Joining No. 1 to No. 2 gives the length of the splint; No. 3 to No. 4 cut out gives a hole for the thumb; No. 5 to No. 6 gives the distal end of the splint across the palm; No. 6 to No. 7 forms the ulnar side of the hand, and No. 7 to No. 2 forms the ulnar edge. When joining No. 4 to No. 5 it is best to make this line parallel to No. 6 to No. 7, as it makes the application of the adhesive easier. (For location of the seven points see Fig. 2.)



FIG. 2.—The anterior splint applied. The numbers indicate the points to be marked when cutting out the splint. Note that the hand is in ulnar flexion, and that the portion of the splint in the palm is well away from the metacarpal-phalangeal joints.

The finished splint then fits the bones of the forearm. If it has been made to fit the arm it is possible for the bones to move within the splints (c. f. Fig. 3).

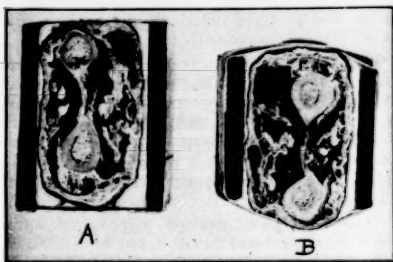


FIG. 3.—Showing the difference in the width of the splints that fit the arm (A) and those that fit the bones (B). It will be readily seen that in A the bones can move within the splints while this is not so in B, where small splints that fit the bones and not the arm are used.

The hand is held in ulnar flexion, which tends to exert traction on the lower fragment of the radius and thus prevents shortening of the radius. Full motion of all the finger and thumb joints is secured, which will keep the tendons from "freezing." (Fig 4).

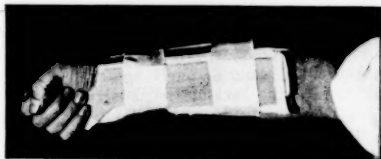


FIG. 4.—The anterior and posterior splints applied. Note that full motion of all finger and thumb joints is secured.

The posterior splint is the same as the anterior except that the hole for the thumb is unnecessary (another perfectly satisfactory posterior splint is a straight piece of splint wood the length of the anterior splint and the width of the forearm bones).

Both splints are now padded—on the side next to the skin—with eight to ten layers of tightly folded sheet wadding (in large forearms it is necessary to insert an extra pad on the anterior surface near the point of fracture to make the splint fit well) and are held in place by three pieces of adhesive,—two, two inches wide and long enough to encircle the splints and the arm. One of these is placed at the proximal end of the splints and the other at the site of the fracture. The third piece of adhesive, one-half inch in width, encircles the splints across palm between the thumb and index finger. When this is applied make sure that the hand is in extreme ulnar flexion.

With the splints in position the patient should be able to move the elbow-joint, all fingers and thumb freely. If the fingers cannot be manipulated so that the tip of each finger can be touched to the thumb the splints do not fit properly, and steps must be taken to make

such motions possible. The commonest cause preventing these motions is that the portion of the anterior splint in the palm of the hand is too long, i.e., it extends beyond the metacarpal phalangeal joints. A second cause is that the whole anterior splint is placed too far distally.

The next point is, how long should the splints be left on? Clinically, union in fractures in lower end of radius begins very early, as is readily demonstrated by the difficulty with which a fracture of the lower end of the radius can be reduced at the end of 48 hours. This is due to impaction of fragments plus inflammatory exudate. Experimentally, it has been shown that in fractures of spongy bone (of which the radius is one) at the end of 48 hours the process of repair—exudate at the site of fracture and organization of the exudate—has well started. Therefore allow twenty-four hours more and the fragments are "stuck" tight enough to allow still more motion to the joints of the hand. Hence at the end of three days remove the posterior splint.

Remembering that the lower end of the radius is the portion which must be held, at the end of one week shorten the anterior splint by cutting two to three inches from the upper end and re-apply.



FIG. 5.—The cut-down anterior splint applied.

At the end of ten days cut the anterior splint down to the width of the radius (Fig. 5). The splint left extends from about the lower third of radius to the middle of the palm with a hole for the thumb. This is held by two strips of adhesive—one at each end. Solid union is secured in twenty-one days. Therefore take off all splints at the end of three weeks.

With the first application of both splints the patient is encouraged to move the fingers constantly—this is extremely important as it will do much to prevent the stiffening of all the joints in the hand. A sling is usually not necessary beyond the first three days except that on the street it acts as a sign, "Don't bump into me, please," and without one the patient will use the hand a great deal more.

In elderly individuals and in patients with arthritic tendencies early massage and passive motion, in addition to active motion of fingers, are all important. When a first-class masseur

is available daily massage and passive motion should begin on the tenth day. Following each treatment the cut-down anterior splint is re-applied. At the end of three weeks the patient is told to use his hand normally, augmenting this with massage. At this time the patient will feel more confident if given a supporting bandage.

#### CONCLUSIONS.

To secure the maximum good results functionally in fractures involving the lower end of the radius treated by immobilization with anterior and posterior wooden splints the following points are important:

1. Break up the impaction.
2. Immobilize with splints that fit the bones and not the arm, *i.e.*, narrow splints.
3. Remove the posterior splint on the third day.
4. Cut down the anterior splint on the tenth day.
5. Remove all splints on the twenty-first day.
6. Be sure of active motion of the fingers at all times.
7. Begin intelligent massage and passive motion on the tenth day.

In a word—"move the joints adjacent to the fractures at the earliest possible moment."

Experience with this method of treatment on the Third Surgical Service (Dr. E. H. Nichols) at the Boston City Hospital, in the Surgical Out-Patient Department and among players on the Harvard football team, has shown that the above method not only maintains the desired continuity of the fractured bones but insures function of the injured arm at an earlier date than any other method.

#### TWO CASES OF EARLY CARCINOMA OF THE UTERUS TREATED BY VAGINAL PANHYSTERECTOMY.

By LOUIS E. PHANEUF, M.D., F.A.C.S., BOSTON.

Associate Professor of Clinical Gynecology, Tufts College Medical School, Boston.

It is not intended that this paper should offer anything new on the subject in question, but merely to serve as a reminder that the vaginal route may offer the solution of certain problems in gynecological surgery where abdominal section is contraindicated. Both of the cases I wish to report were cases that needed operative interference: one, a borderline case in which the disease was discovered only by examination of curettings from the uterus; the other, an epidermoid carcinoma grafted upon a proclivencia of many years' standing. Both cases were declared unsuitable risks for abdominal panhysterectomy by the

medical service of the Carney Hospital; both patients had vaginal panhysterectomies performed and made uneventful recoveries.

CASE 1. Mrs. M. G. S. Age 42. Occupation, nurse. Admitted to the Carney Hospital, November 15, 1921.

*Chief Complaint.*—Excessive flowing.

*Past History.*—Measles and pertussis during childhood. Operation for right inguinal hernia in 1914.

*Menstrual History.*—Onset at 15 years of age; every three weeks; duration ten days; flow considerable in amount; last period October 29, 1921.

*Marital History.*—Married 15 years; one pregnancy complicated by eclampsia 14 years ago; difficult forceps delivery; stillborn child.

*Present Illness.*—Since the birth of her child 14 years ago the patient flowed for ten days at intervals of three weeks; the flow was always excessive in amount. She has lost ten pounds in the last year.

Appetite fair. Bowels constipated. Urination negative. Headaches frequent and severe.

*Physical Examination.*—Negative, except for marked secondary anemia and emaciation.

*Vaginal Examination.*—Moderate relaxation of the vaginal outlet; no sign of infection of the urethra or the vulvo-vaginal glands; moderate laceration of the cervix with erosion. The uterus is moderately enlarged and in good position; the adnexa are normal and there are no masses or areas of tenderness in the pelvis.

Blood pressure 128/85.

Urine examination negative.

*Operation.*—November 17, 1921. Gas ether anesthesia.

The ether examination confirmed the previous findings. The uterine cavity measured three inches. The cervix was dilated and the uterine cavity was curetted, considerable hyperplastic tissue being obtained. The patient made a good ether recovery and convalesced satisfactorily.

*Pathological Report.*—Uterine curettings. Marked hypertrophy of endometrium; suggests possibility of transformation into malignant adenoma; would advise careful watching. (Signed) F. B. Mallory, M.D.

*Medical Consultation, Dr. John F. Fennessey.*—Heart shows a mild myocarditis. The lungs are negative. Would advise a vaginal rather than an abdominal operation.

The above conditions were explained to the patient, who preferred to have a hysterectomy rather than await developments. The vaginal route was chosen because of her poor physical condition.

**Operation.**—November 29, 1921. Gas ether anesthesia. Vaginal panhysterectomy. Double salpingo-oophorectomy.

A circular incision was made around the cervix, and the anterior vaginal wall was opened by a longitudinal incision. The bladder was separated from the anterior wall as well as from the uterus, and the vesico-uterine peritoneum was opened. The cul-de-sac of Douglas was incised transversely and the peritoneal cavity was entered posteriorly. The parametria and the uterine vessels were ligated with No. 2 chromic catgut and divided. The fundus of the uterus was delivered through the opening in the vesico-uterine peritoneum and the infundibulo-pelvic and the round ligaments were ligated with the same material. The uterus and the adnexa were then removed. The parametrial, the round ligament, and the infundibulo-pelvic pedicles were attached to the vaginal cuff and the vaginal incisions were closed with No. 2 chromic catgut interrupted sutures.

The patient made a good ether recovery; there was no elevation of temperature, although the pulse ranged between 130 and 120 for ten days.

**Pathological Report.**—Uterus (fundus, body, cervix), tubes and ovaries. Mucosa almost entirely removed. No evidence of invasion. (Signed) F. B. Mallory, M.D.

December 14, 1921. **Discharge Examination.**—Vaginal incision well healed. The vaginal vault is suspended high in the pelvis. There are no masses or areas of tenderness.

December 18, 1921. Discharged well.

CASE 2. Mrs. M. B. Age 54. Referred by Dr. John T. Bottomley. Admitted to the Carney Hospital, January 17, 1922.

**Chief Complaint.**—"Falling of the womb."  
"Irritating discharge."

**Family History.**—Father dead; cause unknown. Mother died of pneumonia. One brother died of apoplexy at 24 years of age. No tuberculosis, cancer, diabetes or insanity in the family.

**Past History.**—Measles, pertussis and chicken-pox during childhood. Twenty-five years ago the patient had what she described as "slow fever" for two months; this condition was accompanied by fever and chills. Never sick otherwise, never operated upon.

**Menstrual History.**—Menstruation was regular up to 14 years ago, at which time she had the menopause.

**Marital History.**—Married 40 years. Husband living and well. The patient had 14 children; eight are living and well, while six died during childhood. The oldest child is 37 and

the youngest is 16 years old. All deliveries and puerperia were normal.

**Present Illness.**—The patient has had "falling of the womb" for the last fourteen years; five years ago she noticed considerable irritation about the vulva and cervix. The condition was relieved by local medication. Since May, 1921, the patient has had an irritating brownish discharge, which has gradually increased in amount, and has become more sanguinous in character.

Headaches slight; appetite fair; bowels regular. Urination—Day, 4-5; night, 0.

**Physical Examination.**—The patient, who is short in stature, weighs 275 pounds. Head shows no abnormalities to external examination. The teeth are all absent. The tongue is clear, protrudes in the median line and shows a slight tremor. The neck is obese but shows no glandular enlargement; the thyroid is normal. The chest is barrel-shaped, the heart and lungs are normal. The abdomen is very obese and flabby, otherwise it is negative. The blood-pressure is S. 155, D. 88. The urine is negative.

**Vaginal Examination.**—The uterus is prolapsed in the third degree; a large cystocele and rectocele are present; the cervix is markedly hypertrophied and shows a large, raw area with indurated edges; there is no apparent glandular involvement.

**Medical Consultation, Dr. Edward J. Denning.**—Patient's general condition makes an extensive abdominal operation inadvisable; she might stand a quick vaginal operation.

**Diagnosis.**—Uterine procidentia, carcinoma of cervix.

**Operation.**—Vaginal panhysterectomy, anterior colporrhaphy, perineorrhaphy.

January 19, 1922.—Gas ether anesthesia.

The hypertrophied and ulcerated cervix was brought down by means of two sutures placed in sound tissue. A circular incision was made above the ulcerated area, and the anterior vaginal wall was opened in the median line. The bladder was separated from the mucosa and fascia of the vaginal wall, the utero-vesical ligament was cut and the bladder was separated from the uterus. The cul-de-sac of Douglas was then opened and the parametria and uterine vessels were secured by means of No. 2 chromic catgut sutures. The uterus was delivered through an incision in the utero-vesical peritoneum, the infundibulo-pelvic and round ligaments were ligated with the same material and the uterus was removed. There was no glandular involvement in the pelvis as far as could be determined. Because the cystocele was large, the round ligaments were sutured together and interposed between the bladder and the vaginal wall, after the excess of the flaps

had been cut away, and the anterior vaginal wall was closed with interrupted sutures of No. 2 chromic catgut. A high modified Hegar perineorrhaphy was performed for the rectocele.

The patient was on the table fifty-eight minutes; she took ether very badly and oxygen was administered during the entire operation.

The recovery from ether was entirely satisfactory, the convalescence was uneventful, except for a slight amount of urinary incontinence, which the patient overcame in four days. The highest temperature was 100° on the second day after operation and the highest pulse was 104 on the same day.

**Discharge Examination.** — The perineum is well healed and gives excellent support. The anterior wall is healed and is suspended high in the vault. There are no raw areas in the vagina. The patient was referred to Dr. A. J. Leary for x-ray treatments.

#### CONCLUSIONS.

Both of these cases needed operative interference but their general condition contraindicated extensive abdominal operations.

The first case was one in which we felt that a hysterectomy offered the patient a better chance than radium therapy. Because of the marked secondary anemia and the patient's poor physical condition the vaginal route was chosen to avoid the shock which frequently follows the abdominal operation.

The second case had an epidermoid carcinoma of the cervix, the result of prolonged irritation of a neglected procidentia. While radium might have healed the ulceration, it would not have removed the cause of irritation, namely, the uterine prolapse. It was thought advisable to remove the uterus and at the same time cure the cystocele and rectocele. This was done in one stage and the patient made an uneventful recovery.

The vaginal operation has distinct advantages in a selected group of cases. It is contraindicated in the presence of pelvic inflammation and where the uterus is of such size that it cannot be easily delivered into the vagina. It is especially adapted to poor surgical risks whose uteri are freely movable and readily delivered through the vaginal canal.

The main objections to vaginal hysterectomy have been hemorrhage, injury to the bladder and the ureters, and prolapse of the vaginal walls. The first two are easily overcome by ligating the vessels before dividing them and by completely separating the bladder from the uterus, following the technic used in doing the interposition operation. Since in doing an abdominal hysterectomy we use the infundibulopelvic, the round ligament and the parametrial pedicles to suspend the vagina, there is no rea-

son why we should have any more prolapse when doing the vaginal operation than in the abdominal one if we attach the same pedicles to the vaginal cuff. In addition, we are able to remove the excess of the flaps of the anterior vaginal walls, and to build a substantial support for the bladder, if necessary. Furthermore, if the perineum is relaxed, it may be quickly repaired without changing the patient's position, and this also adds to the support of the bladder and the rectum.

The convalescence is usually very satisfactory, and since the intestines are not handled during the operation, distention is practically never encountered as a post-operative complication.

#### Book Reviews.

*Collected Papers of the Mayo Clinic, Rochester, Minn.* Edited by MRS. M. M. MELLISH. Vol. xiii. Philadelphia and London: W. B. Saunders & Co., 1922.

This very valuable volume covers a wide range of subjects, the list of contributors being men most active in the Mayo Clinic at the present time. The contents are grouped under several headings, such as: Alimentary Tract; Urogenital Organs; Ductless Glands; Blood; Skin and Syphilis; Head, Trunk, and Extremities; Brain, Spinal Cord, and Nerves; Technic, and General.

Under the heading of "General" are several papers on cancer, diabetes in relation to surgery, value of radium in malignancy, an article on the trained nurse, a historical review entitled "In the Time of Henry Jacob Bigelow," and an article entitled, "The Medical Profession and the Public."

There is an index of contributors, a bibliographic index, and an index of subjects. One particularly valuable feature of most of the articles is the bibliography appended after each article.

Illustrations are many and adequate. There are 1318 pages, representing about five hundred separate articles. These articles bring many subjects well up to date and furnish much that is new in the way of experimentation, latest theories in regard to causation of disease, and of surgical technic.

The book is one of the most varied and valuable collections of papers yet issued. Our only criticism would be that many of the articles are perhaps too brief and do not give wide enough synopsis in the concluding remarks.

*Internal Secretion and the Ductless Glands.*

SWALE VINCENT. Second Edition. Longmans, Green and Company, 1922.

It is a pleasure to read a good book on the Internal Secretions, particularly at this time, when so many inaccurate, imaginative productions are flooding our bookstores. The second edition of Professor Vincent's book brings it up to date. There is, however, one unfortunate omission: the elimination of references makes its use as a reference book difficult; for on a subject which is changing so rapidly and concerning which there is so much inaccurate material, it is essential for a clear understanding that references be available. There ought to be in the text at least an indication—such as the date of publication after the author's name. This single criticism, however, stands alone in what is otherwise a laudatory review. The method of attack by the anatomical and comparative physiological methods is excellent, and aids markedly in understanding what is known about the functions of the endocrines. And the book has the great advantage of basing conclusions only upon scientific data. There are, consequently, places where it seems incomplete; but this is the fault of our own scientific knowledge rather than of the author's. The book is recommended to those who want to know, without much theorising and with the evidence well described from the scientist's point of view, what has been discovered about the internal secretions.

*Skin and Venereal Diseases.* The Practical

Medicine Series, Vol. vii. Edited by OLIVER S. ORMSBY, M.D., and JAMES HERBERT MITCHELL, M.D. Chicago: The Year Book Publishers, 1921.

The publishers call attention to the fact that "the present volume is one of a series of eight, issued at about monthly intervals, beginning in May, and covering the entire field of medicine and surgery. The series is intended primarily for the general practitioner, but the arrangement in the volumes is such that one interested in a special subject may buy only the part in which he is especially interested.

The seventh volume of the series is devoted to the skin and venereal diseases. In it will be found abstracts from leading articles on the subjects arranged under three main headings, experimental, clinical, and therapeutic.

The articles are abstracted clearly and intelligently. They all have a worth-while story to tell which is well told.

Anyone reading this volume on Skin and Venereal Diseases year by year may rightly feel that he is up with the times. It can be recommended to practitioner and specialist alike. Each will find in it much that is valuable and worth knowing.

*Transactions of the American Gynecological Society.* Vol. xlv.

In this volume the papers read before the American Gynecological Society for 1921 are grouped. They have all been published in other journals before, and they need no special comment at the present time. The one article that stands out in the group is the one by Dr. Sampson of Albany on "Perforating Hemorrhagic Cysts of the Ovary." It is a remarkably clear, well thought out, original piece of work.

*Practical Psycho Analysis.* By H. SOMERVILLE, B.Sc., F.A.C.S., L.R.C.P., M.R.C.S. New York: William Wood & Co., 1922.

This small volume is another treatise on the general principles of psychoanalysis, and it only differs from books of this class in that it discusses almost wholly the clinical aspects of the war neuroses and their underlying mechanism, according to the psychoanalytic viewpoint. In a general way, the practical treatment of the war neuroses has shown the fundamental soundness of psychoanalysis, because it has been demonstrated that the mind of the war neurotic represents a mind which has regressed to an earlier period of childhood. The book is well written, clear, intelligent, and sympathetic. This sympathetic attitude differs from the resistances, prejudices, and emotional discomforts of some writers on the subject, when faced with the truths of this most important of all recent advances in neurological therapeutics.

The book, however, is obscure on several points, such as the introduction of the terms subconscious and co-conscious instead of limiting the discussion to the term unconscious, a procedure which is bound to confuse the beginner. In addition, the example given of eliciting the Oedipus-complex, is too much in the nature of a cross-examination and leading questions, and too little encouragement is given for the spontaneous productions of the subject under analysis. The difficult subject of narcissism is handled very well, except that there is not described with sufficient clearness the important part played by the narcissistic component of sexual hunger, in the production of the anxiety and dread of the war neuroses.

*A Psycho-Analytic Study of Psychoses with Endocrinoses.* By DUDLEY WARD FAX, Ph.D. Washington: Nervous and Mental Disease Publishing Co., 1922.

This volume is number 33 of the Nervous and Mental Disease Monograph series. It is both psychoanalytic and endocrinological, the object of the study being to discover whether or not there existed any correlation between certain endocrine disorders and certain psychotic syn-

dromes. Twenty-two case histories are given in detail. The results of the study seem to corroborate the final conclusions of Kraepelin (who at one time suspected that there might be some connection between schizophrenia and endocrine disorders), but who finally failed to establish any connection between psychosis and endocrine imbalance, particularly after he had attempted for a long time to influence the course of schizophrenia by the administration of various ductless glandular products.

Most of the cases studied in this monograph were schizophrenies of rather intense grade of severity, too introverted and too far removed from reality to be influenced by psychoanalytic treatment. The effects of gland feeding were only temporary stimulation, although the writer feels, that in incipient schizophrenia, a combination of thyroid stimulation and psycho-analysis might be an excellent method of attack.

*Bulletin of the Massachusetts Department of Mental Diseases.* Vol. v, No. 1. 1922.

This excellent publication has now reached its fifth volume and the present number is fully up to the standard of its predecessors. The articles comprise a wide scope in general psychiatry, such as neuro-syphilis, social psychiatry and general papers on more technical laboratory studies.

## Current Literature Department.

### ABSTRACTORS.

GERARDO M. BALBONI	CHESTER M. JONES
LAURENCE D. CHAPIN	CHARLES H. LAWRENCE
AUSTIN W. CHEEVER	HERMAN A. OSGOOD
ISADOR CORIAT	FRANCIS W. PALFREY
ERNEST M. DALAND	EDWARD H. RISLEY
HORACE GRAY	WILLIAM M. SHEDDEN
ROBERT M. GREEN	GEORGE G. SMITH
JOHN B. HAWES, 2d	JOHN B. SWIFT, JR.
JOHN S. HODGSON	WILDER TILESTON
FRED S. HOPKINS	BRYANT D. WETTERELL

OPEN PNEUMOTHORAX IN ITS RELATION TO THE EXTIRPATION OF TUMORS OF THE BONY CHEST WALL.

HEDBLOM, C. A. (*Archives of Surgery*, May, 1922) very thoroughly discusses the question of pneumothorax, the conditions under which it is most liable to occur, its dangers, and its final outcome. He recognizes the disadvantages of having this accident happen in the course of operative work on the chest, but he shows that it may happen under almost all conditions without serious damage. The article furnishes an interesting discussion of this particular subject. [E. H. R.]

THE GENERALIZED TYPE OF OSTEITIS FIBROSA CYSTICA.

MORTON, J. J. (*Archives of Surgery*, May, 1922), gives a brief but thorough description of this disease with a typical case illustrated by many excellent plates, and shows the benefit to the femur from the use of the wedge-shaped osteotomy. He then classifies the types of this disease and gives a chart of the various reported cases. [E. H. R.]

### UNDULANT FEVER IN MALTA.

ZAMMIT (*Ann. Trop. Med. and Parasit.*, vol. xvi, p. 1), and STEVENS (*ibid.*, page 11).—Discussing the prevention of undulant fever, Zammit points out that this disease was promptly and almost completely eradicated from the British Navy in the Mediterranean as well as from the Garrison at Malta after 1906. This followed the promulgation of orders by which goat's milk was eliminated from the dietary of the Garrison and the use of unboiled milk was forbidden in the Navy.

In spite of efforts of the Sanitary Office to instruct the native civilian population, these people remained sceptical as a rule and failed to follow the advice given, with the result that the incidence of undulant fever among them remains considerable.

Adequate inspection of goats and destruction of all infected animals is therefore recommended as the only feasible method of eradicating the disease from Malta.

Stevens provides data and charts which show in a striking manner the incidence of undulant fever in the Navy, the Garrison and in the civilian population before and after 1906.

"A Parasite Resembling *Plasmodium Falciparum* in a Chimpanzee," B. Blacklock and S. Adler (*Ann. Trop. Med. and Parasit.*, vol. xvi, p. 99).

The writers found in the blood of a chimpanzee in Freetown, West Africa, a parasite morphologically indistinguishable from *Plasmodium falciparum*. The parasite appeared to them to be the same as that described by Reichenow in chimpanzees and gorillas and stated by him to be the human parasite.

Failure to transmit the disease experimentally from the case above mentioned to two human subjects led the writers to doubt the correctness of Reichenow's conclusions.

[G. G. S.]

THE ANTI-DIURETIC EFFECT OF PITUITARY EXTRACT APPLIED INTRANASALLY IN A CASE OF DIABETES INSIPIDUS.

BLUMGART, H. L. (*Arch. of Int. Med.*, vol. xxix, No. 4, April 15, 1922), reports in detail a case of diabetes insipidus in which pituitary extract was administered subcutaneously, intranasally, by rectum, and by mouth. The comparative efficiency of these measures is charted. In this case and in three others treated later, extract of the posterior lobe applied intranasally checked both polyuria and polydipsia as effectively as hypodermic injection. The extract can be administered either by spraying the nose or introducing pledgets of cotton saturated in pituitrin. Administration by mouth and by rectum had no effect. This marks a distinct advance in the treatment of diabetes insipidus, in which repeated hypodermic injections become exceedingly trying for the patient.

[C. H. L.]

THE VALUE OF QUINIDINE IN CASES OF AURICULAR FIBRILLATION AND METHODS OF STUDYING THE CLINICAL REACTION.

LEWIS, T. (*Am. Jour. Med. Sci.*, June, 1922, vol. cxliii, No. 6), after giving the methods by which the action of quinidine is studied, speaks of the limitations to, and cautions to be observed, in its use. He says that in some cases a single dose of 0.6 gm. may be sufficient, in others repeated doses up to a total of 10 or 15 gm. may be necessary. The precise limits beyond which it is unwise or unprofitable to proceed are still largely unknown. Contrary to some observers, Lewis finds that the effect of quinidine is practically as great when given with or after full doses of digitalis as when given alone. The simultaneous administration of digitalis has the great advantage of keeping the ventricular rate at a comparatively low level throughout the quinidine reac-

tion and thus eliminating or controlling tachycardia. The ventricular rate often rises after quinidine to from 120 to 160 per minute. This may disturb the patient, and if the auricular rate falls too far a serious accident may occur. Therefore, in cases with high ventricular rates, a combination of quinidine and digitalis is preferable to quinidine alone.

The following contraindications are enumerated:

1. Serious intolerance to quinidine causing sudden loss of consciousness with respiratory standstill. Because of this, the patient should first receive a small first dose to test tolerance.

2. When there is much dilatation of the heart, as shown by congestion of the liver and veins, the use of quinidine is contraindicated.

3. In cases in which there have been signs or symptoms of recent embolism, the use of the drug invites disaster. Auricular fibrillation favors the formation of clots in the auricular appendices, and the reestablishment of normal action favors the detachment of such clots.

The usefulness of quinidine is limited from the clinical standpoint by several facts. First, the high percentage (50) of failures to restore normal rhythm. Second, by its unsuitability when venous stasis exists. Third, and most serious, by its failure to more than temporarily control the fibrillation.

Lewis concludes that so far the value of quinidine has been greater in adding to our knowledge of fibrillation than as a therapeutic agent. "It is a treatment emphatically for the wards rather than for use in an out-patient department."

[C. H. L.]

#### THE PREVENTION OF SIMPLE GOITRE IN MAN.

KIMBALL, O. P. (*Am. Jour. Med. Sci.*, vol. clxiii, No. 5, May, 1922).—This article from the Cleveland Clinic is based on the author's experience in goitre prevention in the public schools of Akron. Simple goitre only is included in his report. This type of thyroid derangement is endemic in some parts of the United States, as well as in Europe. The author believes that whatever the fundamental cause of the condition may be, it is directly due to lack of iodine in the organism. This belief is based on Marine's work, and upon the results obtained in the school children treated.

Three thousand eight hundred and seventy-two girls in the Akron schools were examined. Forty-three per cent. had normal thyroids. Forty-nine per cent. showed slightly enlarged thyroids, six per cent. had moderately enlarged thyroids, and 0.2 per cent. had markedly enlarged thyroids.

The following summary of pupils taking prophylactic treatment is striking. The treatment consisted of the administration of 0.2 gm. sodium iodide daily for ten days, repeated each spring and fall.

	Taking.		Not taking.	
	Totals.	Per cent.	Totals.	Per cent.
Normal:				
Unchanged ....	906	98.8	910	72.4
Increased ....	2	0.2	347	27.6
Slightly enlarged:				
Unchanged ....	447	41.9	698	72.8
Increased ....	3	0.3	127	13.3
Decreased ....	659	57.8	134	13.9
Moderately enlarged:				
Unchanged ....	29	20.3	57	64.0
Increased ....	..	..	21	23.6
Decreased ....	114	79.7	11	12.4
	2,190		2,305	

From these figures it appears that the administration of iodine has a marked effect in preventing simple goitre. No ill effects were noted beyond 11 cases of iodide rash, only 5 of which were severe enough to cause the treatment to be stopped. The article is an important one.

[C. H. L.]

#### SOME PROBLEMS IN INTRACRANIAL DIAGNOSIS.

GORDON, A. H. (*Can. Med. Assn. Jour.*, vol. xii, No. 2, Feb., 1922). Describes nine cases which he groups under this heading, including one of cerebral haemorrhage thought to be intracerebral and pathological but actually on the surface and traumatic; one of chronic pulmonary abscess with cerebral abscess and meningitis, wrongly diagnosed as tuberculous meningitis; tumor of the brain developing in a so-called neurotic person, etc. He emphasizes the need of sufficient and systematic examination and the use of great care in interpreting the evidence. The article is difficult to review and should be read by those interested.

[A. W. C.]

#### MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH.

##### CASES REPORTED WEEK ENDING JUNE 17, 1922.

Disease	No. of Cases	Disease	No. of Cases
Chicken-pox .....	75	Ophthalmia neonatorum .....	17
Diphtheria .....	86	Pneumonia, lobar .....	28
Dog-bite requiring anti-rabic treatment .....	6	Scarlet fever .....	87
Iethargia ....	1	Syphilis .....	19
Encephalitis .....	1	Suppurative conjunctivitis .....	4
Epidemic cerebro-spinal meningitis .....	3	Trachoma .....	1
German measles .....	11	Trichinosis .....	1
Gonorrhea .....	60	Tuberculosis, pulmonary .....	129
Malaria .....	1	Tuberculosis, other forms .....	23
Measles .....	708	Typhoid .....	8
Mumps .....	91	Whooping cough .....	71

##### WEEK ENDING JULY 1, 1922.

Disease	No. of Cases	Disease	No. of Cases
Anterior poliomyelitis .....	3	Ophthalmia neonatorum .....	16
Chicken-pox .....	30	Pneumonia, lobar .....	16
Diphtheria .....	95	Scarlet fever .....	93
Dog-bite requiring anti-rabic treatment .....	12	Septic sore throat .....	4
Encephalitis lethargica .....	1	Syphilis .....	36
Epidemic cerebrospinal meningitis .....	2	Suppurative conjunctivitis .....	5
German measles .....	5	Trachoma .....	2
Gonorrhea .....	78	Tuberculosis, pulmonary .....	130
Influenza .....	4	Tuberculosis, other forms .....	21
Malaria .....	4	Typhoid .....	8
Measles .....	521	Whooping cough .....	101
Mumps .....	54		

##### WEEK ENDING JULY 8, 1922.

Disease	No. of Cases	Disease	No. of Cases
Anterior poliomyelitis .....	2	Pneumonia, lobar .....	20
Chicken-pox .....	71	Scarlet fever .....	56
Diphtheria .....	100	Septic sore throat .....	1
Dog-bite requiring anti-rabic treatment .....	10	Syphilis .....	35
Encephalitis lethargica .....	2	Suppurative conjunctivitis .....	11
German measles .....	4	Tetanus .....	1
Gonorrhea .....	68	Trachoma .....	2
Influenza .....	1	Tuberculosis, pulmonary .....	109
Malaria .....	2	Tuberculosis, other forms .....	22
Measles .....	458	Typhoid .....	12
Mumps .....	44	Whooping cough .....	60
Ophthalmia neonatorum .....	3		

## THE BOSTON Medical and Surgical Journal

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### THE EFFECT ON HEALTH OF ILLUMINATING OR FUEL GAS.

It was formerly contended that the burning of illuminating or fuel gas in living rooms caused an appreciable contamination of the air. This impression persists with some persons at the present time, for the products of combustion are supposed to be poisonous to some extent.

In order to explain the facts relating to the dangers of illuminating gas, Dr. Joseph A. Shears, the sanitary expert of the Department of Health of New York City, has rendered a report which has been published in the *Bulletin* of the department under date of June 24, 1922. This study was inspired by advertisements of a gas company recommending that gas water heaters should be connected to a flue. So far as the toxicity of unburned gas is concerned there is agreement, and the danger of the escape of such gas is quite generally understood, so that all measures which may be employed to prevent such escape or ways for its exit without vitiating the atmosphere are important. So far as the other phase, that of suspected deleterious contaminations of the air, is concerned, it may be surprising to some to learn that carefully conducted experiments tend to show that no damage results from burning gas in apartments occupied by human beings, but on the contrary the quality of the air is improved.

Dr. Shears states that "the combustion of illuminating gas produces, from a chemical standpoint, four different effects on the air taken from a room, mixed with the gas in the burner and discharged back into the room.

"First: The amount of carbon dioxide is increased.

"Second: The amount of oxygen is reduced.

"Third: A very small amount of sulphur dioxide is added.

"Fourth: Dust and bacteria are removed by incineration."

In addition to the chemical action resulting from the union of oxygen with the gas elements, the circulation of air is accelerated and ventilation increased, because the movement of the heated air produces an unbalanced pressure from outside which tends to draw fresh air in through crevices, joints and other openings in addition, to some extent, to that passing through the walls. The heated air in the upper portions of the room escapes in the same ways.

The unhealthful contamination of air in living rooms is usually made up of the excretions from the lungs and skin of the occupants and only to a minor degree by the products of combustion. Excretions are laden with bacteria and decomposing organic matter. It is claimed that exhalations from the lungs account to a large degree for the discomfort felt by occupants of poorly ventilated rooms. The stuffiness is usually attributed to carbonic acid gas, but this gas is found in the purest air, amounting to about four parts in 10,000, and the amount must be increased up to more than 225 parts per 10,000 before the ill effects are produced. Not more than 20 parts in 10,000 are found in interiors usually. For experimental purposes 50 parts in 10,000 have been employed in studying the effect of this contamination, but this was accomplished only with difficulty, for the gas is diffusable. It is therefore contended that the presence of carbonic acid gas is important only so far as it may be an index of other contaminations, for 15 parts in an atmosphere vitiated by human respiration indicates definite pollutions by organic matter. The experiment of Dr. Angus Smith, who shut himself in an air-tight chamber with a lighted candle, and even after the candle failed to burn and 229 parts of CO<sub>2</sub> per 10,000 was developed, felt no ill effect, is quoted, and of Pettenkoffer, who found that 100 parts of carbon monoxide in 10,000 parts of air was not injurious to human beings, while one-tenth of this amount of carbon dioxide derived from lungs and exhalations made the air thus contaminated unfit for human use, both conclusions tending to show that the combustion of gas as ordinarily employed has no bad effect on occupants of rooms.

In comparing gas with electric illumination, Dr. Rideal's tests are quoted, which purport to show that under the influence of equal candle power lamps, electricity causes much more eye strain than gas illumination by mantle fixtures.

The thesis is well presented and puts in plain language facts which should be known by the laity. Apparently electricity has no advantage over gas except that unburned gas is poisonous, so that all those forms of gas burners which may, either through carelessness or other reasons, send unburned gas into a room should be connected with a flue, for pilot lights may go out or a draught may extinguish the flame, or the fixture may be defective.

The question of flue connecting is the subject of an investigation by the American Gas Association and its findings will be of great interest. The Department of Health has postponed action, until this report is available, any further than offering the recommendations that no hot water heaters be permitted in bath or other confined rooms unless the same are flue connected and all automatic hot water heaters be flue connected.

#### ARE THE MEDICAL JOURNALS OF THIS COUNTRY DOMINATED BY THE AMERICAN MEDICAL ASSOCIATION?

In the June issue of the *Illinois Medical Journal* an article credited to *American Medicine* is published, in which it is alleged that a power designated as a star chamber organization is dominating the medical press of the country.

The statement follows that "The fact remains that the medical press of this country is impersonal and timid."

Although the American Medical Association is not named, the description of the dominating organization clearly shows that the A. M. A. is meant.

It is often profitable to see ourselves as others see us and some editors would like to know how our brothers classify us.

Will the *Illinois Journal* and *American Medicine* come more into the open and give the rest of us our rating?

#### BULLETIN OF THE AYER CLINICAL LABORATORY OF THE PENNSYLVANIA HOSPITAL.

This publication has been suspended for eleven years. It is expected that the series now under way will be permanent.

The first article is contributed by Allen G. Ellis, M.S., M.D., under the title, "Amebiasis." This disease is endemic as far north as Baltimore and Washington and occasionally cases are found in the northern tier of states. The contention is made that all cases of dysentery should call for examination of the patient's stools. House epidemics are not uncommon and are due to contact, flies being the important agent.

Specimens from 8,092 persons in twenty-two states and the District of Columbia showed in-

fection by entamoeba histolytica in three hundred and thirty-three persons representing all parts of the country.

Dobell's conclusions that there are six species of amebae living in man but only one, *E. histolytica*, is pathogenic is referred to, and also his statement that evidence of *E. gingivalis* as a cause of pyorrhoia alveolaris is not conclusive. The technical details for the laboratory investigation are given.

Emetin seems to be generally employed in the treatment of the disease and in advanced severe cases the drug has been given intravenously one-half to one grain in 5 c.c. normal salt solution. Children under eight years of age bear one sixth of a grain. It may be necessary to give twelve injections daily. This drug may be used in combination with bismuth iodid by mouth for twelve days. Others use a large dose of bismuth subnitrate by mouth in addition to the intravenous use of emetin.

Several other articles are of interest especially to pathologists. It is hoped that this publication will be continued.

#### REPORTING DISEASES TO THE HEALTH DEPARTMENT.

THE New York City Health Department publishes the report of the conviction of a physician in the Borough of Richmond for failure to report a case of pneumonia. This physician was obliged to pay a fine in addition to the loss of time incident to attendance at court. It would be interesting to know all the circumstances surrounding this court proceeding. If the physician was a defiant offender, sentiment would be in favor of the action taken by the prosecuting officer, but the failure to report a given case may not always mean intentional disregard of the sanitary code. There are times when the strain of work, fatigue and anxiety lead one to forget the commonly accepted responsibility of coöperating with health officials. The report of a prosecution may have a very useful effect in impressing upon physicians the necessity of compliance with health regulations.

In Massachusetts matters of this sort are usually dealt with diplomatically and extreme measures have not often been employed unless the attitude of the offender seemed to indicate a belligerent spirit, for the coöperation of physicians is sought because one may be of great assistance in the maintenance of barriers against the extension of disease. Physicians as a class are not inclined to live according to the letter of the law. They cheerfully render every possible aid, when appealed to, but if a zealous official should try to find occasion for a suit, it is probable that intentional violations of health regulations are sometimes committed by well intentioned doctors.

Practically every operator of a motor vehicle could be convicted in court sooner or later if the letter of the law should be invoked, but police departments are growing more and more discriminating. The same charity should be exercised by officers having charge of the enforcement of regulations which apply to health.

#### OPINIONS EXPRESSED IN THE INDIANA JOURNAL.

The *Journal of the Indiana State Medical Association*, June issue, criticises the University of Cincinnati for allowing the surgeons on the staff of the hospital to charge fees for treating private patients in a special ward. The contention is made that a hospital in connection with a university should be used solely for teaching purposes, and that since there may be a sufficient supply of indigent patients for teaching purposes, the use of this hospital for the treatment of paying patients is not fair to the profession at large.

In the same journal it is stated that chiropractors have spent several thousand dollars per year for some time in legislative and propaganda work in Indiana, but the State Society has spent less than one hundred dollars per year through its committee on legislation. The conditions are referred to as "deplorable," and the inference is plain that the editor believes that the expenditure of money has secured favorable returns for the chiropractors.

#### POLLUTED DRINKING WATER.

Now that the vacation period is on, the usual warning about the danger of polluted drinking water is in order. Although the knowledge that typhoid fever is more often the disease of districts without sewers, visitors to country places occasionally return to urban homes with typhoid fever. Many persons traveling in foreign countries arrange to have antityphoid treatment before leaving home, but visitors to remote localities in our own country are less apt to secure immunity. It happens only rarely that antityphoid treatment fails to protect, but a comparatively few cases of typhoid have been reported even after treatment. Travellers by motor can never be sure that the water supply of a wayside inn, tearoom or inviting spring is wholesome, and milk may have been infected by a carrier. Patients should be warned about water and milk whenever the physician has an opportunity to give advice. If doubtful water is treated with freshly prepared calcium chloride there is practically no danger of contracting typhoid.

The Chicago Department of Health furnishes tablets containing 20 to 30 milligrams of chlorine to those who apply for them. One of these

tablets is to be dissolved in a quart of water. This solution will retain its potency for about a week. When using, one teaspoonful of the clear solution may be added to a glass of drinking water and allowed to stand for five minutes. If the water is especially doubtful, two teaspoonfuls may be used. The taste is not objectionable, but taste and the slight trouble is of very little consequence as compared with the suffering, expense and danger incident to typhoid fever, or even an acute gastro-intestinal disturbance.

Dr. Hermann M. Biggs, in a five minutes' health talk sent out by radio, advises that campers boil the day's supply of water and keep it in bottles. Calcium chloride was used in the treatment of drinking water to some extent in France during the war. One pharmaceutical house is reported as manufacturing calcium chloride tablets.

Milk is a somewhat common culture medium for almost all pathogenic germs, and there may be a few people who for the moment forget that boiling destroys the danger of infection.

#### MEDICAL WORK OF THE UNITED FRUIT COMPANY.

The Tenth Annual Report of the Medical Department of the United Fruit Company for the year 1921 furnishes much valuable information about the diseases found in the parts of the West Indies and Central America where this company operates, and in addition the report contains an appendix dealing with maintenance of health for the guidance of employees of the company.

The appendix covers eleven pages, is written in direct, non-technical language, and should be very helpful in obtaining for the medical staff of the company the intelligent co-operation of the other employees, without which the fullest benefits of sanitation could not be obtained.

The advice given is of a very practical character. It deals with most of the important medical aspects of life in the tropics, includes preparation for undertaking employment in the tropics, and suitable location for the dwelling in a tropical environment. It describes the desirable type of building, sanitation of the premises, sewage disposal, the means of obtaining safe drinking water, discusses food, clothing and bathing, and gives information about the means of preventing serious diseases and of escaping exposure to insects which might otherwise cause suffering or introduce disease.

In the Letter of Transmittal from Dr. Deeks, general manager of the medical department, it is pointed out that malaria is the most prominent cause of morbidity, but that great progress is being made year by year in sanitary measures for its prevention. Draining, filling, the use

of larvicides, screening of dwellings and the administration of prophylactic quinine are among the methods used, and it is stated that gratifying results have been obtained in the divisions where quinine prophylaxis has been used systematically.

The use of paris green as a larvicide by the method of Dr. Barber of the U. S. Public Health Service has been instituted and will be reported upon later.

At Puerto Castilla in Honduras, where the buildings of the company stood on swampy ground, pure water has been piped in from the mountains and dredging and filling operations have changed the character of the environment, which was exceedingly bad, so that now this port is said to be as sanitary as any in the tropics. The original condition of the locality and its appearance after completion of the work are shown in photographic reproductions.

Alastrim has been practically eliminated by systematic vaccination. All employees have been examined for hookworm and those infected have been treated until cured. Substantial progress has been made in combating venereal diseases as well.

The wise practice of making a thorough physical examination of all prospective employees and of all officers and members of the crews of steamships operated by the company, at the commencement of each voyage, has been continued. At Preston and Limon, where hospital accommodation was insufficient, new hospitals of excellent construction have been built and put into operation within the year.

The medical department consists of port medical officers in New York, New Orleans, Boston and Cristobal, and of hospital and dispensary personnel in the seven operating divisions of the company and those attached to two railroad companies as well.

Some idea of the magnitude of the work can be gained from the figures which follow. The company has under cultivation 395,000 acres of land and undertakes itself to care for the people living in these cultivated areas. It treats not only its employees and their families, but also a considerable number of other individuals living in the same localities who are in no way connected with the company but who would be unable otherwise to obtain either medical advice or hospital treatment.

A comprehensive series of tables gives statistical information about the medical work done in each of the divisions, on the passenger steamers and in the ports. These tables are well worthy of careful study. They show that more than 208,000 cases were treated by the nine medical districts in the tropics with 1050 deaths, a mortality of about five per 1000, or 0.5 per cent. When figured on the basis of the number of persons dependent on the company, the aver-

age rate is 7.44 per 1000, but it varies from 2.75 to 12.62 in different divisions. The average rate compares very favorably with that of the Canal Zone, which, during the ten-year period from 1911 to 1920 inclusive has been 12.49 per 1000 population,\* and with rates for large cities in the United States; for example, the average for the ten-year period from 1911 to 1920 inclusive in Boston has been 16.97 per 1000 population.†

The causes of the great differences in the rates for the various medical districts of the company have doubtless been the subject of special study by Dr. Deeks. It seems probable that the rates have been influenced by factors which do not appear in the report. Similarly, the tables show other prominent figures which raise questions of interest.

The table of deaths by disease shows in a striking manner that persons in the tropics are by no means free from diseases prevalent in the temperate zone. For example, the maladies of the respiratory tract taken together, but excluding tuberculosis and cancer, caused 254 deaths, as compared with 167 for all types of malaria. In the former group 157 deaths are attributed to lobar pneumonia, a figure not far below that for malaria. The varieties of tuberculosis account for 91 deaths and acute and chronic nephritis for 86 more.

The relatively small proportion of deaths from infectious intestinal disease, *i.e.*, 24 for typhoid and 33 for all kinds of dysentery, points to good sanitary arrangements. On the other hand, the morbidity from malaria is still high and it is to be expected that subsequent years will show a marked reduction resulting from the campaign being waged against this disease.

The United Fruit Company is to be congratulated upon the showing of its medical department and upon its enlightened policy of working for the prevention of disease among its employees. The company has set a standard which less prosperous business organizations may find it difficult to attain, but health is a fundamental requirement for the worker and failure to appreciate this fact and to guard against illness has, doubtless, ruined many an enterprise in the tropics.

#### INFANT MORTALITY.

THE American Child Hygiene Association has published its statistical report of infant mortality in cities of over 10,000 population in continental United States. Its first report for 1919 covered 269 cities, in the second report for 1920 519 cities in the death registration were covered, and this last report covers 573 cities with a population of 40,434,121.

\*Canal Zone Department of Health Annual Report, 1920.

†Annual Reports of the Health Department of the City of Boston.

There are 664 cities of 10,000 or over in the death registration area, so that the report of 1921 covers 89 percent. of the cities and 94.4 percent. of the population of the death registration area. Cambridge and Lawrence of this state do not appear in the returns.

The figures of the Massachusetts cities from which the statistics are available are as follows:

City.	Population.	General Death Rate All Ages for 1921.	Infant Mortality Rate. 1920.	1921.
Beverly	22,561	10.4	54	39
Brookline	37,748	10.2	66	41
Winchester*	10,485	12.1	64	41
Melrose	18,204	11.1	56	45
Greenfield	15,462	11.1	87	51
Newton	46,054	9.9	64	51
Winthrop	15,455	8.9	40	52
Southbridge	14,245	12.1	58	53
Chelsea	43,184	12.7	63	54
Leominster	19,744	11.8	69	54
Watertown	21,457	7.8	73	55
Attleborough	19,731	13.7	67	59
Northampton (2)	21,951	18.7	86	60
Webster	13,258	11.9	56	61
Newburyport	15,618	14.4	85	62
Arlington	18,665	12.9	67	63
Woburn	16,574	10.7	78	63
Brookton	66,254	10.1	71	64
Braintree*	10,580	15.2	81	66
Northbridge*	10,174	10.2	90	68
Pittsfield	41,763	12.9	65	68
Marlborough	15,028	12.3	69	69
Springfield	129,614	11.3	85	69
North Adams	22,282	12.1	70	72
Lynn	90,148	11.1	82	73
Salem	42,529	13.9	85	74
Haverhill	53,884	12.0	92	75
Worcester (2)	179,754	12.9	85	76
Boston	748,090	13.5	101	77
Somerville	93,001	10.2	80	77
Danvers* (2)	11,108	25.9	65	79
Gardner	16,971	13.1	102	86
Saugus*	10,874	13.1	82	92
Holyoke (3)	60,203	12.3	117	92
Clinton	12,979	13.3	116	95
Lowell	112,759	12.9	135	95
New Bedford	121,217	11.0	122	96
Easthampton*	11,261	12.9	91	101
Plymouth	13,045	17.1	147	101
Fall River	120,485	14.2	129	113

The death rate in those places where there are institutions, which add materially to the figures, should be considered in any interpretation; for, taking Danvers, for example, with the large insane hospital and the comparatively small population, the figures which give the highest death rate for all ages should be construed accordingly. Holyoke is reported to have an institution which adds to the infant mortality. All co-ordinate influences should be studied in any analysis made. It would be interesting to have the Fall River authorities explain the reasons for the unusually high infant mortality rate.

\*Places first listed as over 10,000 population in 1920 Census. Early statistics often unobtainable.

(2) Important State institutions located here influencing crude death rate.

(3) Large institution for infants, drawing from all parts of state, located here, and materially affecting infant mortality rate.

Plymouth, too, has had an abnormally high rate for several years.

Although those in the group included in the low rates may feel complacent there may be reasons for this fortunate state of affairs and these cities may be under obligation to show the others how the results are obtained.

The impressive showing presented by these figures is that there has been a marked average improvement all over the state and Public Health officials should feel encouraged. In all probability the great factor in promoting better conditions lies in the general dissemination of information relating to the causes of infant mortality, and if this is true, there is reason to believe that the people are absorbing the advice on health matters which officials have been sending broadcast during recent years. It is reasonable to believe that still better conditions are to be realized in the future through the application of practices advised by our leaders in health matters.

#### NEWS ITEMS.

DR. LELAND FRENCH has been appointed District Health Officer in the Berkshire District.

THE REGULAR BI-MONTHLY MEETING OF THE FRANKLIN DISTRICT MEDICAL SOCIETY was held at the Weldon, Greenfield, Tuesday, July 11, 1922, at 11 A. M. Programme: "What the American Medical Society Is and What It Stands For," Dr. H. G. Stetson, Greenfield; "Recent Observations while with the Mayo Brothers," Dr. C. L. Upton, Shelburne Falls.

DR. HAVEN EMERSON has been appointed professor of public health and administration in the College of Physicians and Surgeons, Columbia University, and given the task of working out a plan for the organization of the Institute of Public Health established by the bequest of the late Joseph A. DeLamar.—*Science*, June 30, 1922.

DR. REID HUNT of the Harvard Medical School has been elected on the editorial board for Physiological Reviews for 1922.—*Science*, June 30, 1922.

DR. WILLIAM D. WHEELER of Revere, Mass., is leaving for New York to take up an intensive course of training in dermatology and syphilology at the Skin and Cancer Hospital. Dr. Wheeler is junior assistant on the staff of the skin department of the Boston Dispensary.

DR. JOHN LORENZO HEFFRON resigned as dean of the Syracuse University School of Medicine on June 15. This resignation terminates the connection which Dr. Heffron has held with the

teaching staff of the medical school for forty years, during fifteen of which he has served as dean. Dr. Heffron was made dean emeritus.—*Science*.

At the time of the celebration of the centennial of Pasteur's birth, in Strasbourgh, a congress of hygiene and bacteriology will be held for discussion of questions relating to disease. In order to show the sympathy of Great Britain with the projects of the French committee, a British committee composed of the following members has been formed: Sir Charles Sherrington, chairman; A. Chaston, H. E. Field, Professor Percy R. Frankland, Sir John M'Fadyean, Professor C. J. Martin, Sir W. J. Pope, Sir James Walker and Sir Almroth Wright.—*Science*.

On June 4, at the special invitation of the governors and the medical school, Professor Harvey Cushing took over the directorship of the surgical unit of St. Bartholomew's Hospital and replaced the director, Mr. Gask, for ten days. The compliment was, as it were, a return for a like compliment paid to Mr. Gask last year, when he acted as temporary chief of the Peter Bent Brigham Hospital, Boston, to which Dr. Harvey Cushing, as professor of surgery at Harvard, is surgeon.—*Science*.

DURING June a nutrition institute was held at Lincoln, Nebraska, and courses on the work of the nutrition class were given at the Summer School of Education conducted by the Cleveland Public Schools. At the latter session there were about forty workers in training preparing for extensions in this work in the Cleveland schools. The Lincoln Institute was the first called by the Department of Medical Inspection in a city. Dr. Katherine Wolff has organized this department effectively and is planning an attack upon malnutrition in the schools. About one hundred were in attendance, including a number of physicians. One of these, Dr. Margaret W. Koenig, has just become a member of the staff of the Children's Bureau at Washington and will begin her government service in the state of Tennessee. A school nurse from South Dakota was present who is doing remarkable work in her district. She is now planning for a traveling clinic which will take care of adenoid and tonsil operations. The work in this institute was recognized by the University of Nebraska and full credit is given for courses taken in it. Dr. William R. P. Emerson gave addresses before the Rotary and Pathfinders' Clubs of Lincoln and a large public meeting as well as dinners and conferences of representatives of the leading child-helping organizations, including the Associated Charities and the Juvenile Court, the educational executives of the university and the public schools, members of the medical and dental associations. In September an institute will be

given in Hartford, under the direction of Nutrition Clinics for Delicate Children, followed by others in Poughkeepsie, Battle Creek, Denver and Honolulu.

**OPENINGS FOR JUNIOR MEDICAL OFFICERS IN GOVERNMENT SERVICE.**—The United States Civil Service Commission states that there is urgent need for eligibles to fill positions of junior medical officer in the Indian Service and the Coast and Geodetic Survey and that the Commission will receive and rate applications until further notice. Competitors will not be required to report at any place for a written examination, but will be rated upon the subjects of education, training and experience as shown by their applications and corroborative evidence. Full information concerning salaries, etc., and application blanks may be secured from the United States Civil Service Commission, Washington, D. C., or the board of civil service examiners at the postoffice or customhouse in any city.

**DEATH RATE IN BOSTON.**—During the week ending July 1, 1922, the number of deaths reported was 178, against 150 last year, with a rate of 12.11. There were 15 deaths under one year of age, against 16 last year. The number of cases of principal reportable diseases were: Diphtheria 54, scarlet-fever 21, measles 144, whooping-cough 10, typhoid fever 1, tuberculosis 18. Included in the above were the following cases of non-residents: Diphtheria 7, scarlet-fever 2, measles 1, tuberculosis 1. Total deaths from these diseases were: Diphtheria 4, scarlet-fever 1, measles 1, tuberculosis 16. Included in the above was the following case of a non-resident: Diphtheria 1.

**DEATH RATE IN BOSTON.**—During the week ending July 8, 1922, the number of deaths reported was 180, against 149 last year, with a rate of 12.29. There were 25 deaths under one year of age, against 25 last year. The number of cases of principal reportable diseases were: Diphtheria, 44; whooping cough, 21; scarlet fever, 21; typhoid fever, 1; measles, 98; tuberculosis, 40. Included in the above were the following cases of non-residents: Scarlet fever, 4; tuberculosis, 2. Total deaths from these diseases were: Diphtheria, 3; tuberculosis, 21. Included in the above was the following case of a non-resident: Tuberculosis, 1.

**DR. ROBERT RICE**, a fellow of the Massachusetts Medical Society since 1920, died at the Hale Hospital, Haverhill, July 9, 1922, at the age of fifty-two.

He was born in Scotland, coming to this country twenty-five years ago. He graduated from the Hahnemann Medical College and Hospital of Philadelphia in 1908 and settled in Haverhill, where he did a general practice and served on the staff of the hospital in which he died.

He is survived by his widow.